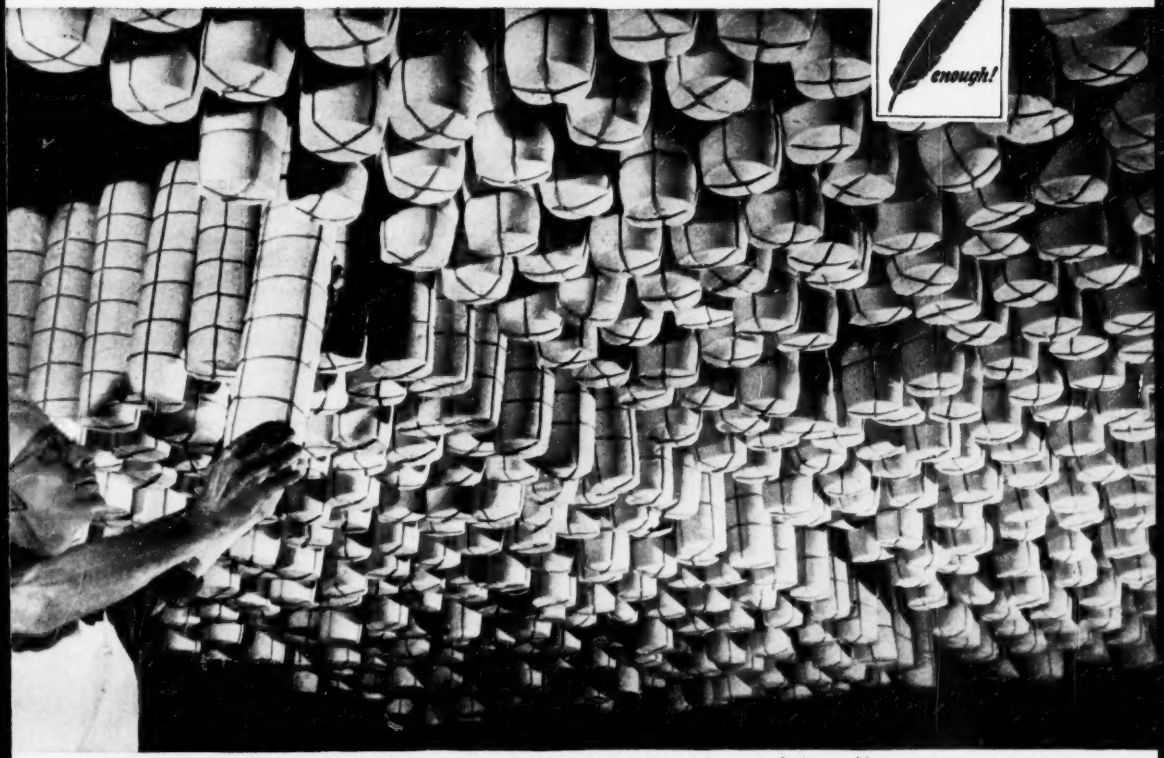
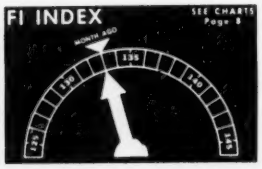
NATIONAL EDITION

Food Industries

For those who control quality and costs through management and production—a McGraw-Hill publication

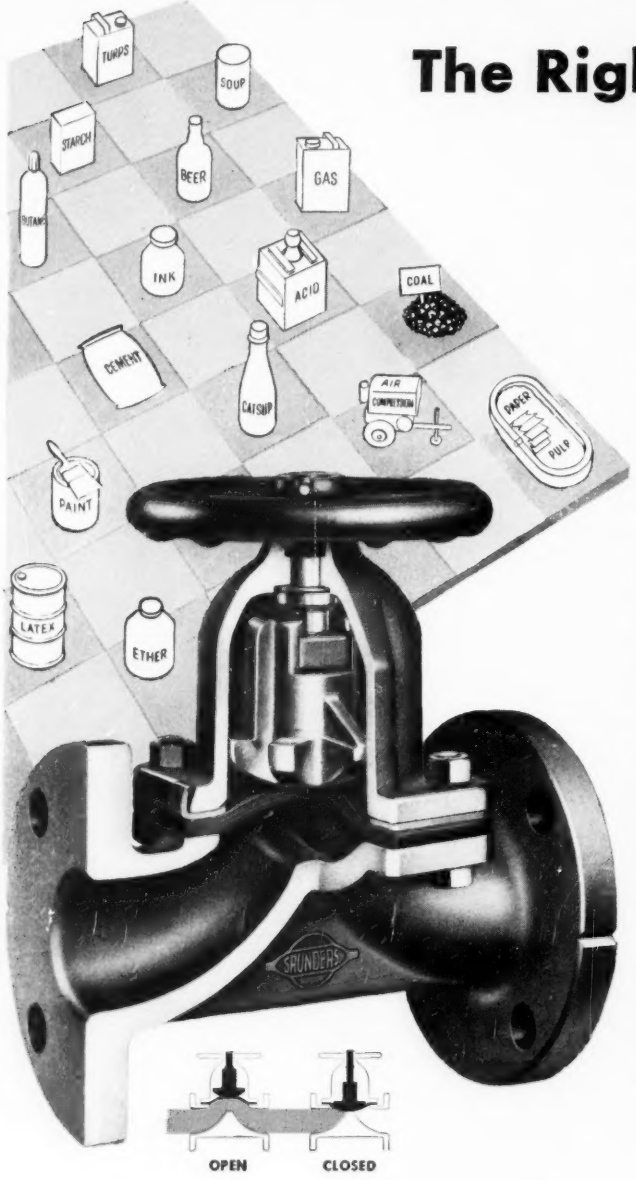


Salame cheeses—2 tons plus—are hung in Plymouth, Wis., plant of S & R Cheese Corp., ready for smoking process.



OCTOBER, 1950: Get ready for 1960, Canning with antibiotics, Glass lines do A-1 job, How to save on water, Pace-setting plant, Accident stoppers

The Right Move . . .



to prevent corrosion, contamination or clogging

Whenever corrosion, abrasion, contamination, clogging, leakage and maintenance are problems . . . Grinnell-Saunders Diaphragm Valves provide trouble-free performance. Working parts are absolutely isolated from the fluid in the line, preventing corrosion or contamination. Smooth passage, without pockets, eliminates trapping of solid matter and reduces friction resistance to a minimum. The diaphragm lifts high for streamlined flow in either direction. It presses tight for positive closure against grit, scale, solid matter . . . against pressure or vacuum. No packing glands to demand attention . . . no metal-to-metal seats to become damaged or wire-drawn . . . no refacing or reseating. Various body, lining and diaphragm materials are available to meet particular service conditions.

The Grinnell-Saunders Diaphragm Valve is typical of Grinnell's complete piping service which provides the products, facilities and experience required "whenever piping is involved". Grinnell Company, Inc., Providence 1, R. I.

Grinnell-Saunders Diaphragm Valve

Available in various combinations of valve bodies and operating mechanisms. Write for catalog.

GRINNELL

pipe • valves • Grinnell-Saunders diaphragm valves • pipe and tube fittings • welding fittings • engineered pipe hangers and supports prefabricated piping • Thermolier unit heaters • plumbing and heating specialties • industrial supplies • water works supplies Grinnell automatic sprinkler fire protection systems • Amco humidification and cooling systems

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HOW TO USE POSTCARD

Circle numbers of items you want to know more about; fill in your name and address; drop in mail (no postage required). We will tell companies what you are interested in and they reply direct to you.

TO MAKE IT HANDY

Products and literature in this issue are listed on these pages. There are three indexes: (1) editorial items on new equipment, new products, new literature; (2) products advertised; (3) advertisers.

WHAT THE NUMBERS MEAN

Advertisements: There is a page number on the postcard for each advertisement. Before the number may appear, L, R, T, B (left, right, top, bottom) locating the ad on the page; small letters following (a, b, c) indicate additional products in the advertisement.

Editorial Items: There is a page number on the postcard for each editorial item; ABC's distinguish the specific items on the page.

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Right Move . . .

to prevent corrosion, contamination or clogging

Whenever corrosion, abrasion, contamination, clogging, leakage and maintenance are problems . . . Grinnell-Saunders Diaphragm Valves provide trouble-free performance. Working parts are absolutely isolated from the fluid in the line, preventing corrosion or contamination. Smooth passage, without pockets, eliminates trapping of solid matter and reduces friction resistance to a minimum. The diaphragm lifts high for streamlined flow in either direction. It presses tight for positive closure against grit, scale, solid matter . . . against pressure or vacuum. No packing glands to demand attention . . . no metal-to-metal seats to become damaged or wire-drawn . . . no refacing or reseating. Various body, lining and diaphragm materials are available to meet particular service conditions.

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be fittings • welding fittings • engineered pipe hangers and supports
heating specialties • industrial supplies • water works supplies
oms • Amco humidification and cooling systems

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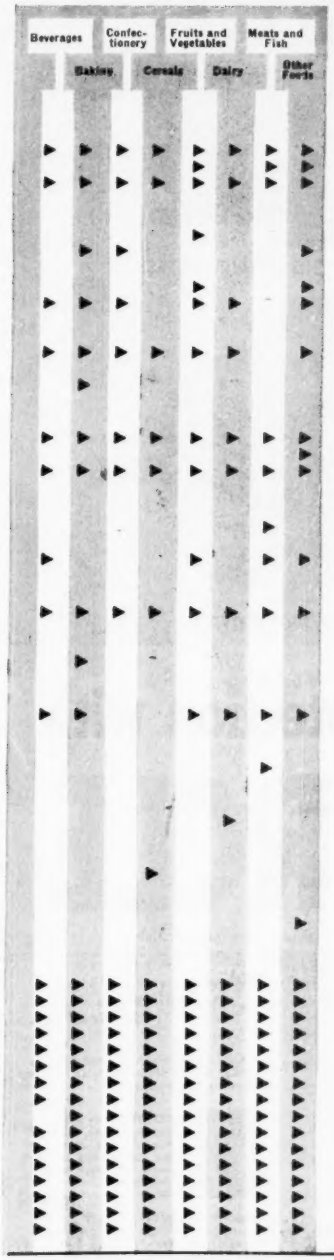

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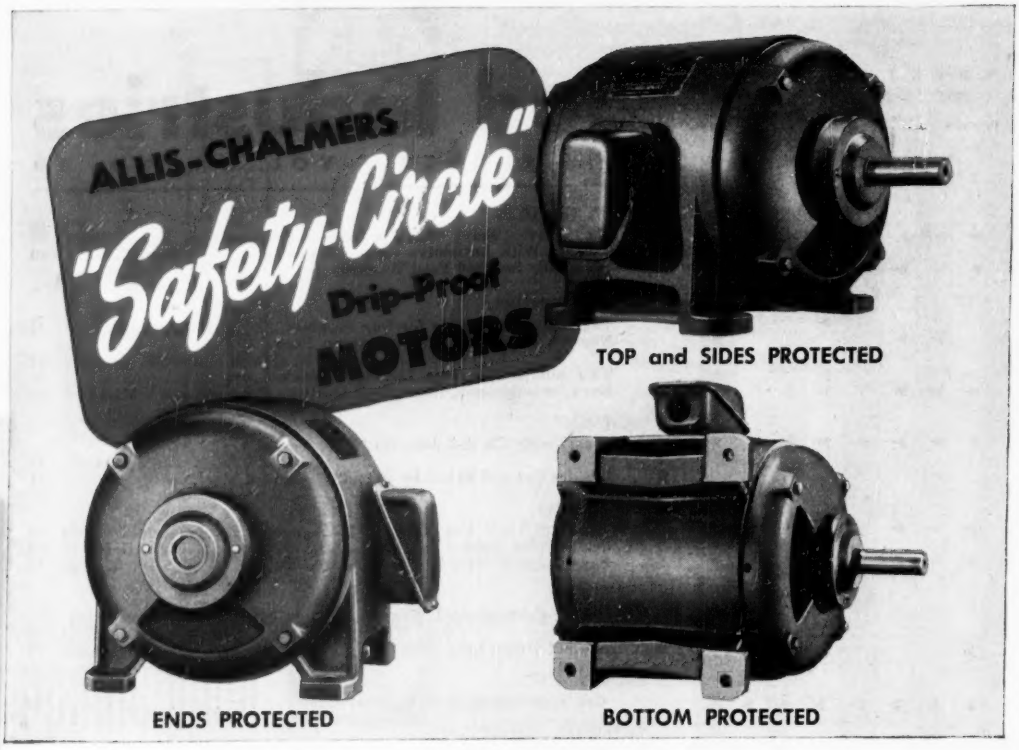

Get All-Around Motor Protection with

SAFETY-CIRCLE

THAT SOLID CAST IRON FRAME protects *Safety-Circle* working parts against physical damage from every angle. The completely enclosed bottom provides extra protection and extra strength. End brackets are drip-proof at no premium.

Because the frame is cast iron, it is resistant to rust and corrosion. It withstands physical abuse and will not distort.

Protected Inside, Too

Safety-Circle protects against internal breakdown with multiple-dipped and baked stator and die-cast aluminum rotor. *Ball bearings are factory-lubricated and need no attention for years.* Wide open internal construction and large fans keep temperatures well within rated limits.

Don't be satisfied with a motor that gives you less than full protection. Insist on the extra protection of *Safety-Circle.*

For complete details on *Safety-Circle* advantages, see your A-C Authorized Dealer, Sales Office, or write for Bulletin 51B6210B. Sizes from 1 to 20 hp, 326 frames and smaller.

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CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE — Belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.

PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

HIGHLIGHTS

Cooperative advertising of four related food items has been engineered by General Foods. Program capitalizes on the fact that sale of one food stimulates demand for associated products. Featured is a breakfast menu that includes Log Cabin syrup, Aunt Jemima's pancake flour, butter and a meat product. Idea permits companies or industries to jointly promote products at a fraction of the cost of separate campaigns. Two-product campaigns have been practiced by several groups in recent years.

Interlocking cartons are Gerber's answer to market's demand for half cases of baby foods. Made up of two units, each holding 24 of the 5-oz. cans, the case permits mixed-lot shipments to wholesalers and retailers. (Pg. 77)

Concentrated pineapple juice will be produced in Cuba by National Concentrators, Inc., as soon as the low-temperature evaporator is installed. There is a similar development in Puerto Rico. So Hawaiian packers are beginning to think they had better get into the concentrate field, too. They are scheduled to start pilot plant research very soon.

Cutting water consumption 25 percent, Jacob Ruppert brewery came up with an annual saving totaling 72,000,000 gal. Company-wide probe of all operations yielded 13 separate water-conserving methods—and most of them can be applied in any food plant. (Pg. 52)

A newly designed refrigerated freight car operating efficiently at temperatures as low as 10 deg. F., and holding to a 3 deg. range, is to be unveiled within a few days. Builder also promises more usable space, doors that will permit entrance of lift trucks, and a smooth, flush interior surface.

Unwanted color changes in packaged fresh frozen meats can be due to nitrite contamination of the wrappers. Tests with nitrite-impregnated papers have brought out such discoloration on meats in storage, and these undesirable hues have remained even after cooking. (Pg. 58)

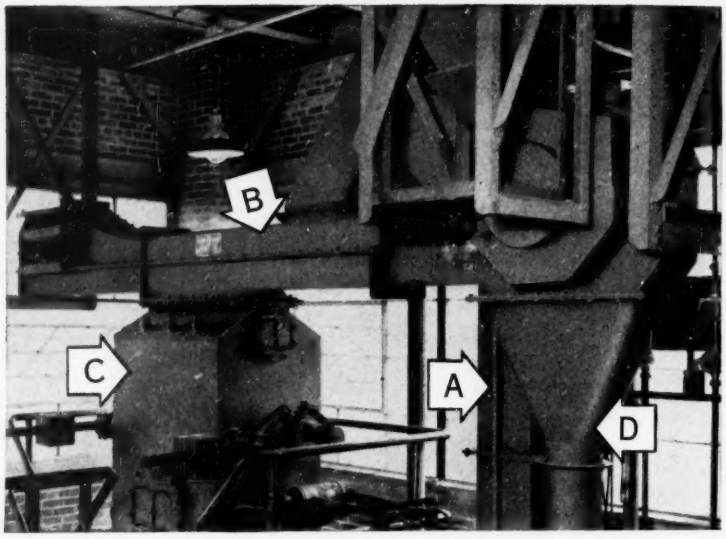
All packaged foods—canned, frozen, or in paper bags—are safe to eat after exposure to radio activity from an atomic blast. Atomic Energy Commission wants help in getting across understanding that only outside of package is affected. Contents will remain okay if package is opened carefully.

With a new dehydrated pea soup, developed by QM Food & Container Institute, the soldier needs only a cup, some water and the powder to set himself up with a nourishing and tasty dish. A heating device will help, so will a spoon, but they are not essential. (Pg. 44)

Wider bidding on contracts to supply non-perishable foods to the armed forces is being sought by the Quartermaster. Invitations to bid are rolling out in increasing numbers, and the Chicago Quartermaster Depot is anxious to supply complete information on them and on contracts awards, to any and all manufacturers of foods, food components and ingredients, packing and packaging materials.

Handling Bean Flakes at *Ralston Purina Mills*

Efficiently, Safely, Economically via BULK-FLO



Typical elevator, conveyor, feeder arrangement at Ralston Purina Mills, solvent extraction plant. Raw flakes elevated by Bulk-Flo (A) discharge to horizontal Bulk-Flo (B), feeding Blaw-Knox extractor (C). Overflow is carried by lower run to collecting hopper (D), then chuted to foot of elevator (A), at ground floor.

• • •

Below: Flaked beans discharged through chute to loop type Bulk-Flo elevator which raises them to 6th floor of extraction building (A in photo above).

Enclosed, Compact Conveyor Operates at Low Cost

Up to two hundred twenty-five tons of soy beans pass through this plant in 24 hours. The bean flakes are handled from flaking machines to solvent extraction tower by Link-Belt Bulk-Flo elevator-conveyor-feeders. This installation is typical of the growing number of solvent extraction plants relying on Link-Belt Bulk-Flo for safe, efficient handling of this material.

The Bulk-Flo is simple, self-feeding, self-discharging and requires a minimum of supporting structures. Power consumption is low, upkeep is negligible. Let Link-Belt engineers help adapt Bulk-Flo to your problems.

Ask for Book Number ▲ 2175

LINK-BELT COMPANY

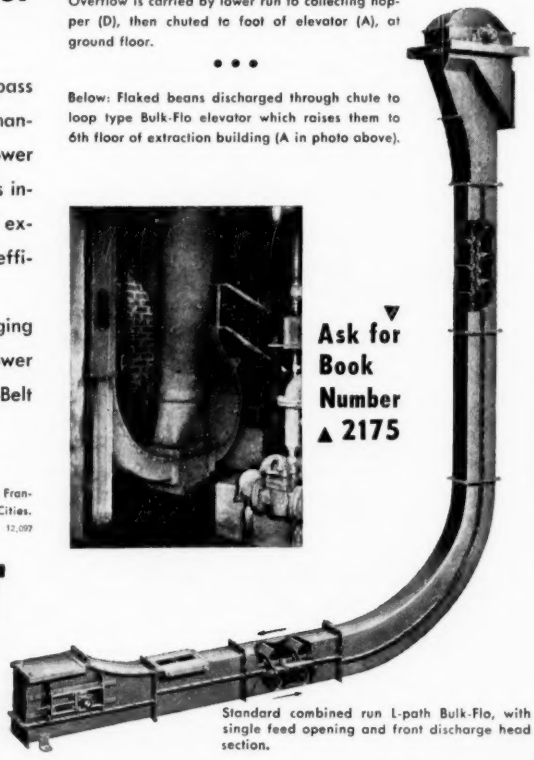
Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Johannesburg. Offices in Principal Cities.

12,097

LINK-BELT

Bulk-Flo

Elevator-Conveyor-Feeder



Standard combined run L-path Bulk-Flo, with single feed opening and front discharge head section.

The Talk of the Industry

Award for Achievement

Has your company developed or adopted a better process in recent years? If so, why not go after industry-wide recognition via the 1951 FOOD INDUSTRIES Award for achievement in food technology?

Just write the Secretary of the Award Jury in care of FOOD INDUSTRIES, then submit information for the Jury (for details see page 132, July FI).

Fast New Lard Process Developed

Something new and different in a lard rendering process has been installed at Shen-Valley Meat Packers, Inc., Timberville, Va. And a long list of advantages are claimed for it, the outstanding being production of a bland high-quality lard, low labor costs, and only about 15 minutes process time.

Developed by Pavia Process, Inc., Washington, D. C., the rendering method involves only a few steps. Fat is ground through a 1/8-in. plate and fed into a steam-jacketed kettle. An agitator projects the small fat particles against the 315-deg. F. kettle wall, then withdraws the rendered fat and fat tissues toward the center of the mass. When the mass reaches 180 deg. F., the liquid fat is strained into a receiving tank, ready for chilling and packaging. The water is said to be retained by the strained-out cellular tissue, which is a white, fluffy edible material.

Washington Has Real Food Man

Food processors are fortunate in having one of their own in a key advisory position in Washington. We refer to Frank C. Elliott, food planning specialist in the Production Office of National Security Resources Board.

Mr. Elliott knows a lot about the food industry and its production and marketing operations and problems. His experience goes back to 1912, when he joined American Can Co. Later he was connected with Northwest fruit, vegetable and salmon canning firms. Then he joined Peabody of London and has operated their Seattle food business and served as a director of the New York branch. He had experience in dehydration in World War II, knows the dried fruit business well, and has been to the Orient to stimulate food production for Peabody. Furthermore, he is no stranger to Washington, having served as NSRB consultant since 1948.

Welcome—Food Protection Committee

Month by month, the subject of chemicals in foods becomes hotter—with the proposed bread standards adding new fuel to the flame. And this fire will not soon die down.

This lends particular importance to the recently organized Committee on Food Protection of National Research Council. Its function are: (1) To evaluate scientific data on chemicals proposed for addition to food, or for use that will affect food products. (2) To organize such data for use, and to point out missing data. (3) To recommend further experimental study, kinds of evidence, or data required.

The Committee intends to follow the principles of NRC in maintaining independence and objectivity. Then it can act as an impartial fact-finding and advisory agency to which both government and industry can look for constructive recommendations.

Such an agency is needed. And it should be supported by food processors—at least until it shows what it can do.

Nice Thought, But a Bit Wishful

There is an excellent, but somewhat wishful, recommendation in the proposed Federal standards for grades of frozen concentrated blended grapefruit and orange juice. It is to the effect that the frozen product be kept at a temperature of zero or less in transit.

Good trick, if you can do it with ice and salt refrigeration in railway cars.

And That Dangerous "Grade D"

The proposed blended juice standards include "U. S. Grade D" or "Substandard." Such a grade is customary, but in this instance it better be kept off the consumer market. Frozen concentrated citrus juices skyrocketed to success on quality equalling that of freshly squeezed juice. Their popularity curve can shoot the other way if third-rate quality is peddled.

Hors d'Oeuvres

■ Back around 1900, the owner of the Jello company tried to sell the entire business for $35. No taker! The Indians were better salesmen. They closed the deal for Manhattan Island.

■ USDA talks of shipping dried eggs to Korea. We bought these particular eggs from Communist China—possibly to bolster our own supply, which was down to only three times the 1945-49 average. This gives a round trip of 8,000 miles and a nice boat ride for both eggs and taxpayers.

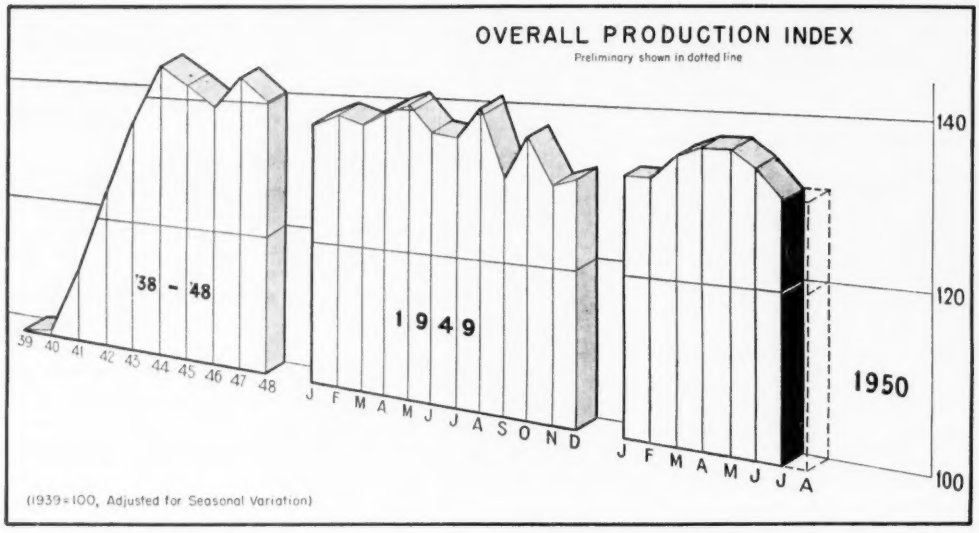
■ Anyway, there isn't much danger of a rice surplus. They're now using the stuff to remove carbon from auto engines without removing the cylinder head. Just blow the rice in, then blow it out. General idea isn't as new as the auto people seem to think.

■ One GI direction for preparing the meat and spaghetti in the new combat ration tells 'em to drop the unopened can into boiling water. When can shows "an alarming bulge" food is ready to eat. Probably could solve the opening problem by just ignoring the bulge.

■ A recent movement must be nipped in the bud. A Milwaukee theater manager, reports *Pathfinder*, recently designated Monday evening as "Dignity Night." Popcorn eating on that night was restricted to one section only. Just because some people don't like popcorn doesn't mean they can't be dignified.

■ Popcorn sales are increasing in direct ratio to TV expansion, a survey reveals. Even the movie people, who can only read big print, should recognize this bit of handwriting on the wall. **J.A.J.J.**

FI Index and Outlook


OVERALL PRODUCTION INDEX
Preliminary shown in dotted line
'38 - '48
1949
1950
39 40 41 42 43 44 45 46 47 48
J F M A M J J A S O N D
J F M A M J J A
140
120
100
(1939=100, Adjusted for Seasonal Variation)

Processing Operations Continue Below Last Year's Level

PRODUCTIVITY was leveling out in August, continuing at 133, the same as the revised July figure. Operations are still below last year's level for the food industries as a whole. This is principally due to the reduced size of fruit and vegetable packs. The latest Agriculture Dept. report estimates the total supply of vegetables for canning at 6 percent below 1949, and with fruit supplies also short, this year's total pack may well be down at least 5 percent. The FI canning index has been running further behind 1949, but will probably show a rise for September because of the heavy tomato pack.

As the peak canning season draws to an end, other food industries will play a larger part in determining the total volume of food output. The outlook is for a rise in meat packing, continued high activity in dairy products, and an increase in the forthcoming beet sugar crop. Flour production, which sank during the summer months with the collapse of the export market, should soon level out. So total processing activity may be expected to gain in the months just ahead.

A key factor in the demand for many packaged foods will be the attitude of distributors toward inventories, now that the first rush of scare buying has passed. Korea caught many grocers with relatively low stocks and, even now, rebuilding has probably not gone too far. The odds favor a continued increase in inventories, since prices are still rising. But the price advance has slowed down a bit. And this may make grocers more cautious.

One of the sharpest production increases over 1949 is that shown by sugar. As the FI chart shows, output was running well ahead of last year before the outbreak of hostilities in Korea. And of course demand has soared since that time. Total deliveries from refiners (both beet and cane) to consumers will probably top 8,000,000 tons in 1950 Consumption will run around 7,700,000 tons, with the difference going into consumers' inventories.

The 1950 sugar crop has run ahead of 1949 in most regions. The beet sugar producers, in particular, will soon be refining the biggest crop on record—almost 2,000,000 tons. The Florida-Louisiana cane crop will come in next at about 577,000 tons.

Among the offshore producers, Hawaii and Puerto Rico have had crops about the same as last year's. But deliveries from Hawaii have been normal, whereas last year they were strikebound. The principal offshore supplies still available from the past season's crop are those held by the U. S. government in Cuba. Out of Cuban crop of 6,100,000 tons (a 400,000 ton increase over 1949), the U. S. still holds 600,000 tons, of which about 32,000 tons were allocated for September delivery to U. S. refiners. Most of the U. S. holding will remain a reserve for the tight period between the end of the beet sugar season and the beginning of 1951 deliveries from Cuba.

The combination of big domestic

At a Glance—

(1939 = 100, with all figures adjusted for seasonal variation.)

	July 1950	June 1950	Percent Change	Year Ago
Baking	125	125	0	125
Butter	75	82	−9	69
Canning	153	155	−1	147
Cheese	163	167	−2	157
Confectionery	132	130	+2	126
Evap. Milk	123	124	−1	125
Flour	112	102	+10	111
Ice Cream	164	177	−7	184
Malt Liquors	176	179	−2	179
Margarine	275	259	+6	301
Meat Products	149	143	+4	143
Sugar	108	106	+2	86

sugar crops and a still sizable offshore reserve is expected to ease the pinch on sugar supplies in the immediate future. Recent months have seen a seasonal high in demand because of the canning rush. Sugar is reported to have sold up to $14 a bag in the "resale" market, compared to the list price of $8.05 at the time. At present, resale prices are a little above the $8.25 list. And price pressure may well die down when the record beet crop starts moving this month. Equally important, the step-up in refinery operations should end delivery delays, particularly in the Western states served by the beet producers.

The 1951 outlook is for rising production in most parts of the world. An increase of 3 million tons, or 8 percent, in world production is possible in the crop year that started last month. Larger crops are expected in Europe, Puerto Rico (where production restrictions will probably be abandoned), and the Phillippines. In addition, inventories have been climbing throughout the world.

Depends on Inventories

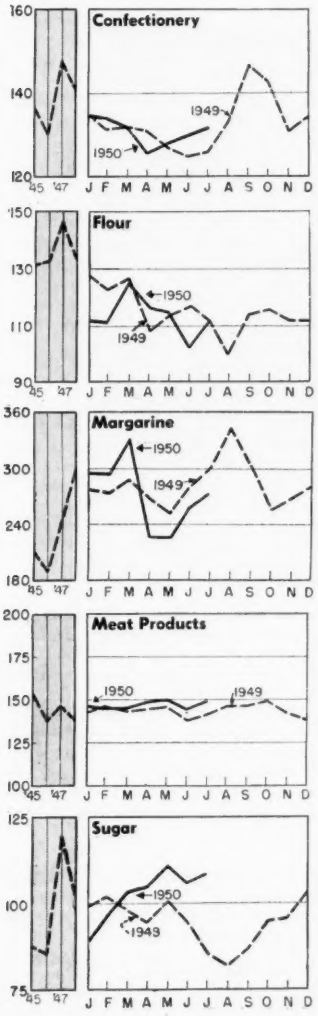
Maintenance of current high level refinery operations depends on whether consumers will continue to carry these high inventories in the face of growing world production. In the past, such heavy production has always brought with it price declines and inventory losses to holders. However, fear of war and its effect on the availability of sugar acts as a powerful incentive to keep high inventories on hand at this time.

In the U. S. domestic market particularly, demand hinges on the inventory policy of canners, confectioners and other big users of sugar. It also depends on how much refined cane sugar was taken by housewives and industrial users during the last few months. If this type of buying should subside, with beet sugar output increasing, the cane sugar refineries may operate at a somewhat lower rate next year. On the other hand, output probably could be stepped up on the basis of estimated supplies, if the war scare is intensified.

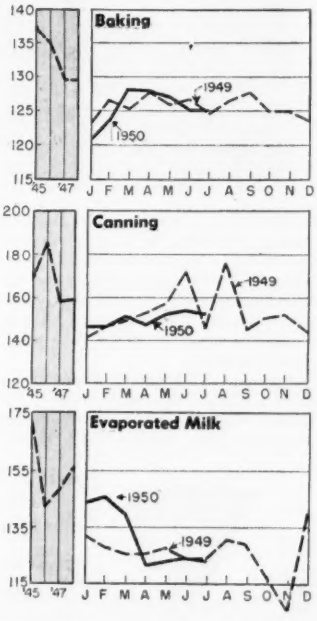
The frantic demand for sugar in recent months has affected corn sugar and syrup as well as the cane product. Corn grinders are now operating near 100 percent of plant capacity, compared with an 80 percent rate early in the summer. The monthly grind has increased from 10,000,000 to 12,000,000 tons. Chances are good that capacity operations will continue into next year. Aside from sugar, demand will continue strong for such corn products as starch, corn oil and feeds. The rising level of activity in the textile industry is a particularly strong factor in the immediate as well as long term outlook for starch.

Another sidelight to the strong sugar situation is the development of a really tight market in molasses. The rearmament boom has boosted demand for industrial alcohol, a molasses product, to the point where molasses may be hard to get right through 1951, despite big crops of raw sugar.

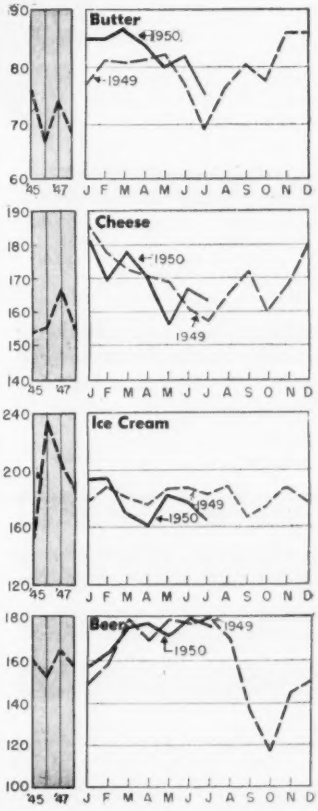
RISING ▲



STEADY →



FALLING ▼



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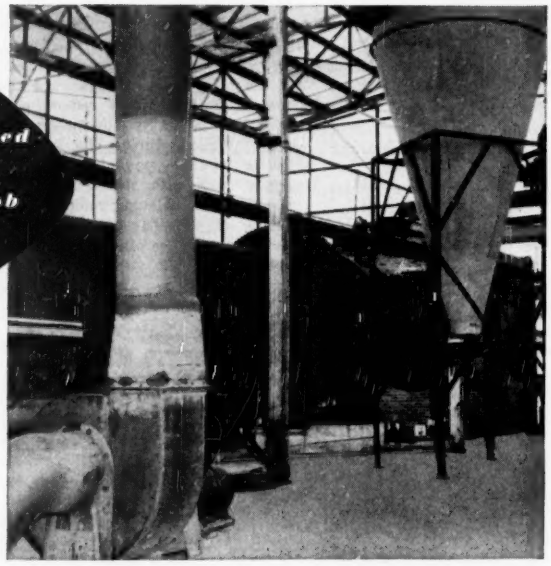

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Installed cost	$9,000.00
Annual production (tons)	450
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What Washington Thinks

"VOLUNTARISM"—The emergency control of commodities can be on the basis of voluntary control by producers or by official regulations through quotas or specific allocations. Many business spokesmen are urging "voluntarism." Such a method would be very nice, if everybody would cooperate. Experienced Washington knows that in almost every industry there are a few who won't do things voluntarily. Hence, it is to be expected that rigid controls or allocations will be required whenever a commodity reaches the stage that the normal business methods breakdown. It is still worthwhile to urge good sense and self control on almost all food commodities. But if genuine scarcities develop, lookout!

FARM INCOME—Increases in market-basket prices of foods have permitted increases in prices of food raw materials. Or perhaps the latter caused the former. In any event, farmers this year will have a cash income within 2 percent of that of last year, according to recent Bureau of Agricultural Economics forecasts. At the beginning of the year the guess was a decline of nearly 10 percent, but not now.

A HUNGRY WORLD?—The office of Foreign Agricultural Relations is now arguing that Americans ought to buy more goods abroad so that farm surpluses in this country may be bought by the foreigners more extensively. Obviously, the effort is to get means for more ready disposal of present surpluses owned by the government. If that could be accomplished, then the price-support advocates would have an easier time getting authority for the subsidies to agriculture that they wish to continue. It would be equally nice for food companies if they could get someone to apply similar reasoning effectively to the surplus of processed food, which sometimes develops. Neither the Department nor the Congress seems to like to extend their reasoning to the food manufacturing business.

DECEPTIVE DEMAND—Recently, a group in Washington got to talking about its troubles in manufacturing enough food to meet the large increase in demand at the grocery stores, which began about the first of July. There was even some talk that plant capacity would have to be increased hastily in order to supply the growing market. A more thoughtful member of the group said, "Do you expect this big increase to continue?" Actually the basic information available from government offers no evidence that real consumption is any higher today than it has been for the last couple of years. The major expectable further shift will come, if at all, by substitution of less expensive items for those in the luxury class. The housewives' family food budgets do not increase as rapidly as do the market-basket prices. Other increases in consumption can be expected to be small, for family incomes have for sometime been at an all-time high, permitting both real consumption and other disappearance of foods to be at all-time record levels.

CABINET CONTROVERSY—National defense programs have been held up because both Congress and the President have had difficulty in deciding who would do what. Apparently, the President wanted to put the planning and operating function largely under National Security Resources Board. Congress had definitely different ideas, both for patriotic and for political reasons. Furthermore, four cabinet officers aspired to be the czars of war planning and operation in their areas of interest. This group was made up of Secretary of Commerce Sawyer, dealing with industry problems; Secretary of Labor Tobin, dealing with labor questions; Secretary of Interior Chapman, handling natural resources projects; and Secretary of Agriculture Brannan, dealing with farm and food questions. Whatever the situation may be when this item is read, it is certain that further changes will be made from time to time as big men able to do a big job effectively are discovered and given a chance to use their talents in the public interest. Policies may not change as fast as do the administrators who handle them.

FOOD COLOR—Quality of food, and consequently the price obtainable for it, often depends on the attractiveness of the color of the product. In far too many cases there is no accurate control for regular reproduction of the wanted color in such products. Measuring the color is often difficult; but unless measured and known accurately it is hard to be sure what one is trying to reproduce. National Bureau of Standards has issued a basic scientific review of this subject in its Circular 478. Anyone who wants to do more than just look at his product and guess what the color is will profit by sending 30c. to the Superintendent of Documents, Washington 25, D. C., and asking for this circular on "Colorimetry".

PACK 'EM RIGHT—An elaborate research on egg breakage during rail movement discloses that "eggs break or are damaged easily." But it also gives useful proof that it is the slack between cases lengthwise of the car that does the most damage during rough handling. Well demonstrated is much greater loss with eggs loaded five cases high as compared with four-case high loads. Also shown by this Production & Marketing study is the necessity for avoiding packing of oversize eggs in normal cases. There is a definite commercial disadvantage in the eggs that have been bred up to oversize, judged from the aspect of a standard case and fillers.

IRREGULAR CHEESE PROCESSING—Cheese makers have recently experienced considerable difficulty, Department of Agriculture experts say, because even the well standardized "starter" behaves irregularly with certain milk supplies. The trouble often comes from the presence in the milk of traces of penicillin. This antibiotic appears in the milk from cattle that have been treated for mastitis. The quantity is not sufficient to be serious to public health, but it does cause irregular functioning of the culture used in cheese making. No means of eliminating the penicillin has been found. It is necessary, therefore, to avoid using milk from treated cows for at least several days following treatment of the cattle with penicillin.

FREIGHT BILL—During the last war, railroads took in fully twice as much money for freight service in hauling food as did truck carriers. Today, the freight bill paid to trucks is almost exactly the same as that paid to railroads. This shows the extensive development of truck hauling. Incidentally, the total yearly food freight bill is now approximately $2.52 billion. This is more than two-and-one-half times what it was just 10 years ago. The climb is partly increased rates and partly increased quantity of goods hauled.

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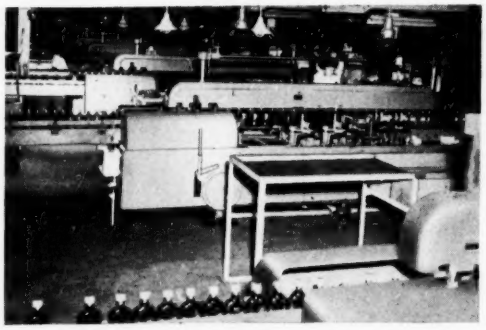

Installation of Pneumatic Duplex Labelers in production at K. D. & W. plant of National Distillers Products Corp., Louisville, Ky.

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CONTINUOUS
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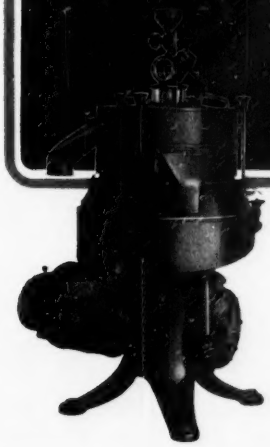
TO SPEED
UP YOUR PROCESSING



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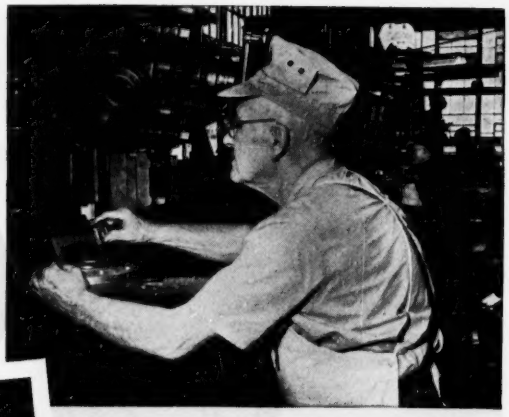

Mr. Claude Waltz, operating a Bullard high-speed boring mill here, started at OIC in 1896, at age 19, as an apprentice machinist.

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And now the same management, engineers, test experts, and production men who kept Internationals a tradition in the heavy-duty truck field have developed *every new International Truck*. No matter what size truck you use, there's a heavy-duty engineered International Truck that's right and ready for you!

You'll find new comfort in the new Comfo-Vision Cab

Model for model, here is "the roomiest cab on the road." It gives you new comfort in easy-riding cushions, adjustable seats, controlled ventilation. It gives you full front visibility through a one-piece, scientifically curved Sweepsight windshield.

And comfort is right at your fingertips when you take the sturdy wheel. The entire steering system is engineered for more positive control from a more comfortable position.

You'll get an all-new truck proved under actual operating conditions

"Proved under actual operating conditions" takes in years of time, millions of dollars, countless miles. But these new Internationals took in all those and then some—to give you proved-in-advance performance.

No matter what kinds of roads or loads, climate or conditions your trucks must meet, there's a new International that has been *proved* right for your requirements.

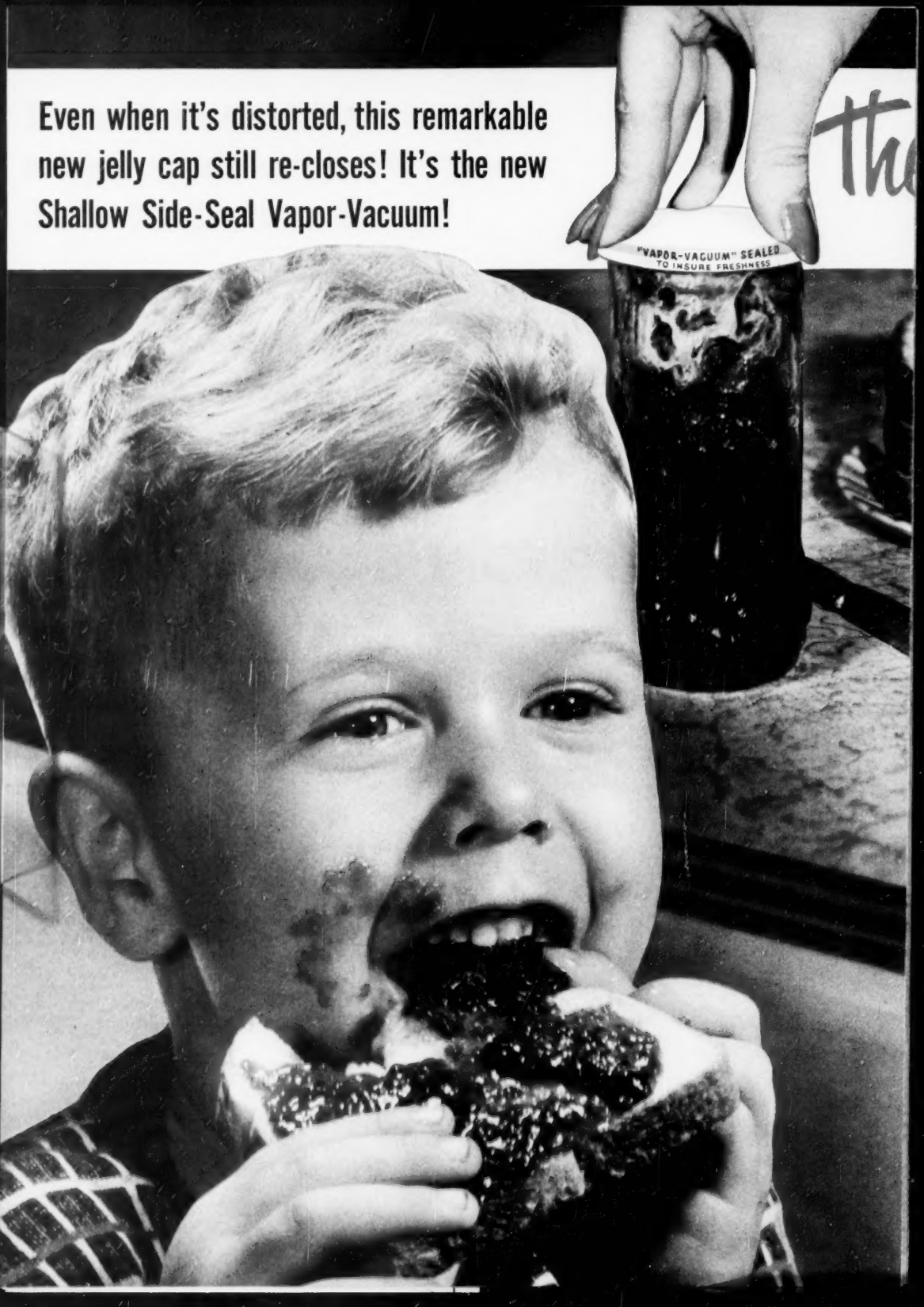
Find out all about that truck from your nearest International Truck Dealer or Branch, *soon*.

International Harvester Builds
McCormick Farm Equipment and Farmall Tractors
Motor Trucks . . . Industrial Power
Refrigerators and Freezers

ALL NEW, ALL PROVED

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY CHICAGO


Even when it's distorted, this remarkable new jelly cap still re-closes! It's the new Shallow Side-Seal Vapor-Vacuum!
"VAPOR-VACUUM" SEALED
TO INSURE FRESHNESS

Jelly Picture has changed!

Today—after just one year—the new Shallow Whitecap is solidly established as the No. 1 closure for jellies!

It's just a year, now, since White Cap Co. announced the new Shallow Side-Seal Whitecap for tumbler packages.

Yet already the Shallow Side-Seal has had a powerful effect on packaging procedure in several important fields. Among these, one of the most striking has been *jelly packing.*

On jellies, the new Shallow Side-Seal has established a completely new standard of closure performance. *In just a year, it has moved far ahead of all other types of jelly closures.*

As a result, numerous leading packers have already changed over to this new closure. Many others are in the process of changing.

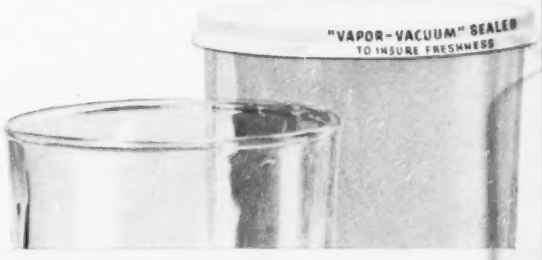
Consumers are happier!

Among packers who are using this new Vapor-Vacuum Tumbler Cap, there's complete agreement that this closure carries unequalled *consumer appeal.* It has given users, for the first time, both of the features they want most—*easy opening* and *adequate re-closure*—a combination never before available for tumbler packages.

Furthermore, Vapor-Vacuum's Shallow Side-Seal delivers this new combination of features without the slightest sacrifice of sealing efficiency. The cap is a true Whitecap, with all the qualities of this long famous line.

Two new refinements of design

The amazing action of the new tumbler cap is largely a matter of *pliability.* By using *a more malleable plate* and by *reducing the vertical dimension,* we achieve an unusual degree of flexibility.



Because of this new flexibility, the cap responds to the ordinary hook opener with the greatest of ease. And also because of this flexibility, *hook opener damage is completely defeated.* If the cap is distorted in opening, there's no harm done. Easy finger pressure bends it right back into position—so that it keeps on serving as a dust-proof, odor-proof cover.

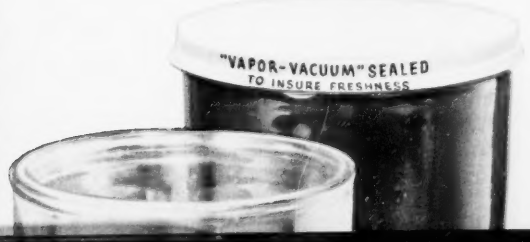
No other jelly closure can furnish such performance as this!

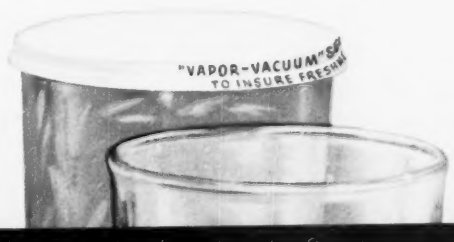
Packers who are already using this cap say it is one of the finest investments any jelly packer can make.

VAPOR-VACUUM

Seal and Re-Seal

PRODUCT OF WHITE CAP CO., CHICAGO





GREAT IDEAS OF WESTERN MAN . . . ONE OF A SERIES

Jean Jacques Rousseau on education for citizenship

There can be no patriotism without liberty, no liberty without virtue, no virtue without citizens; create citizens, and you have everything you need; without them, you will have nothing but debased slaves, from the rulers of the State downwards. To form citizens is not the work of a day; and in order to have men it is necessary to educate them when they are children.

CONTAINER CORPORATION OF AMERICA

New Savings

WITH LUNKENHEIMER BRONZE VALVES BALANCE YOUR RISING MAINTENANCE COSTS

YOU'RE familiar with Lunkenheimer bronze valves, but have you considered them in connection with your plant costs?

Take a look through your own plant. Chances are, you'll find Lunkenheimer bronze valves — still on the job after a decade . . . a quarter century or more of service. You've been keeping your maintenance costs down on those installations, without giving them much thought. With bronze valves, as with everything else, it's the upkeep that really counts. Why not *create new savings* by "going Lunkenheimer" all the way?

Slip this page in your follow-up file, and write for the latest information on Lunkenheimer bronze valves. It's available from the leading industrial distributor in your area, or from The Lunkenheimer Co., P. O. Box No. 360Q, Annex Delivery Station, Cincinnati 14, Ohio.

BRONZE • • • STEEL • • • IRON

LUNKENHEIMER

THE ONE *Great* NAME IN VALVES

how 3 food plants cut costs with G-E adjustable-speed drives

You, too, can get more out of your machines with the right adjustable-speed drive from the complete G-E line!

Here are just three food processors who turned some perplexing problems into profitable production by coming to General Electric—headquarters for electric adjustable-speed drives. And here's the moral:

To meet *your* specific needs, General Electric recommends only the *right* adjustable-speed drive. Here is the broadest line of its kind—*sure* source for the *right* speed for *every* job!

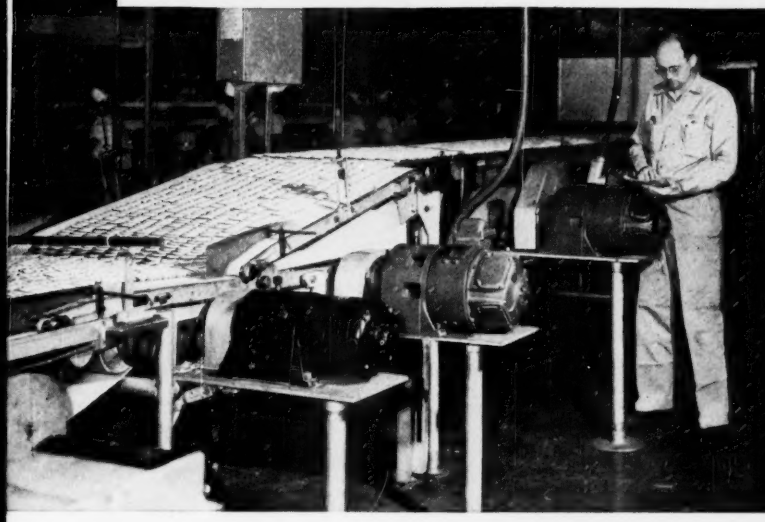
A G-E food industry specialist will gladly help you apply adjustable-speed to get more out of your machines. Call him at your nearest G-E office, or send the coupon for more data. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

IN BEET SLICING—OUTPUT KEPT HIGH!

One of the nation's largest beet sugar factories—the Moorhead, Minn. plant of the American Crystal Sugar Co.—uses these three G-E Tri-Clad® 50-hp wound-rotor a-c motors to provide adjustable speed in slicing beets. Individually controlled, they drive the beet-slicers at most efficient speeds for an average output of 50 tons per hour each. G-E wound-rotor motors are a low-cost choice for simpler jobs where limited speed adjustment and wide speed regulation are permissible. Also available are G-E adjustable-speed d-c motors for food plants already equipped with a d-c distribution system.

GENERAL ELECTRIC

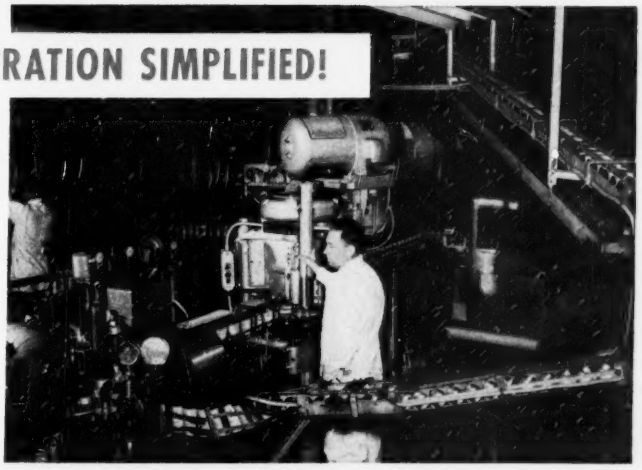
IN BISCUIT BAKING—PRECISION CONTROL ASSURED!



On a 600-foot continuous biscuit-production line at the Keebler-Weyl Baking Co. of Philadelphia, 26 G-E Thy-mo-trol® drives closely co-ordinate individual machine speeds. Rated ½ to 7½ hp, they keep the entire line in step, and help maintain plant cleanliness. In addition to ultra-accurate and versatile Thy-mo-trol, G-E packaged adjustable-speed drives also include speed variators and electronic speed variators.

IN BEER CANNING—OPERATION SIMPLIFIED!

"Make Mine Ruppert" and "Make Mine ACA" are synonymous slogans at the Jacob Ruppert Brewery in New York, where a conveyor system to process cans through filling and capping machines is driven by a 10-hp G-E Tri-Clad ACA motor. To vary output from 105 to 315 cans per minute — formerly done by manually adjusting a belt—finger-tip dialing now produces instant speed changes. Operating on a-c power without conversion equipment, ACA motors give stepless speed control over ranges up to 20 to 1, in ratings from 3 to 75 hp. Also available, in ratings from 1 to 15 hp and up, are ACA gear-motors for low adjustable speeds.



WANT MORE DATA?

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Apparatus Department, Schenectady 5, N. Y.
Please send me the following bulletins:
(V) for reference purposes
(x) in connection with immediate project

( ) GEA-4883—ACA Motor
( ) GEA-5334—Adjustable-speed manual
( ) GEA-5335—Speed Variator
( ) GEA-5336—Electronic Speed Variator
( ) GEA-5337—Thy-mo-trol Drive

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A WHOLE NEW CONCEPT OF INSTRUMENTATION IS REVOLUTIONIZING THE FOOD

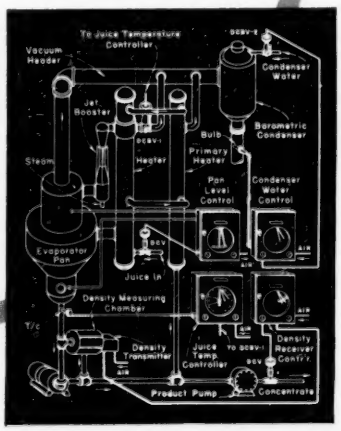
PASCO ACHIEVES UNPRECEDENTED

REVOLUTIONARY BROWN CONTROL

LIKE conventional process equipment and methods . . . conventional instrumentation is going by the boards. Changes are being made . . . daring, radical changes which bring an entirely new concept of process possibilities to the industry. One realization of this is illustrated in the operation of the world's largest frozen juice plant—the Pasco Packing Co. plant at Dade City, Fla.

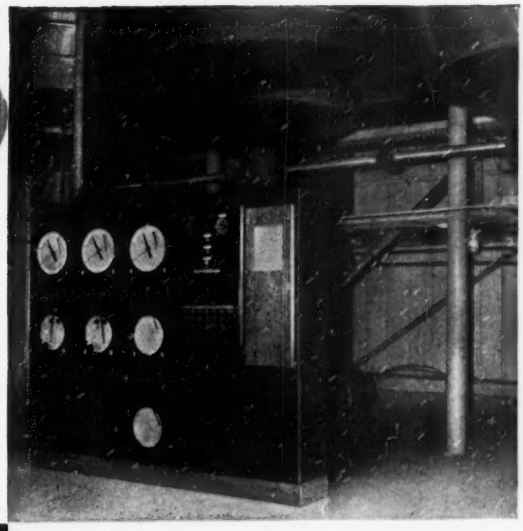
Pasco has discovered that *only through a complete control system can close control of variables and high operating efficiencies be assured.* Proof of this is found in the plant's evaporator control system. The unique evaporators, designed by C. D. Atkins of the Florida Citrus Experiment Station, required a creative application of instruments. Controls for density, level, temperature and flow were all integrated into a completely automatic system. As a result, *creative instrumentation* permits an hourly production of 1250 gallons of 42° Brix concentrate in a *1 man operation!*

In this plant, continuous measurement and automatic control maintain high production of a top quality product with a minimum of personal supervision. The same *creative instrumentation* which is helping Pasco produce better products at lower cost can also help you. Call in your local Honeywell engineer today . . . he is as near as your phone. MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4502 Wayne Ave., Phila. 44, Pa. Offices in more than 80 principal cities of the United States, Canada and throughout the world.

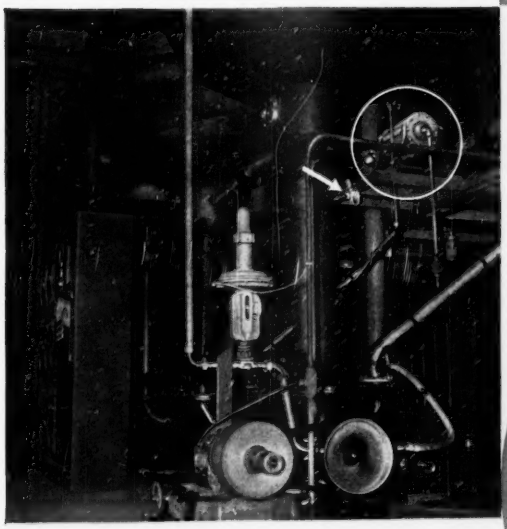


Schematic drawing representing control system used on Atkins evaporator at Pasco Packing Co. Evaporator pan represents all three stages.

EFFICIENCY WITH SYSTEM



Atkins evaporators are visible behind control panel. One man operates both triple-stage evaporators with the aid of Brown instrument control board to turn out 1250 gallons of high-quality 42° Brix juice per hour. ▶



▲ *Density sampling chamber (circled) continuously measures density of juice leaving last stage of evaporator; adjusts rate of removal through Honeywell-Saunders Patent Valve in foreground. Thermocouple (arrow) measures juice temperature, is connected to ElectroniK recorder.*

An example of Honeywell creative instrumentation in the Pasco installation is the new Density Controller . . . heart of the evaporator control system, it controls final product concentration. The density controller consists of:

1. *A chamber through which a sample of the concentrated juice is continuously passed.*
2. *A submerged displacer whose buoyancy varies with the density of the fluid in which it is immersed.*
3. *A pneumatic-balance unit.*
4. *An instrument which measures the buoyancy of the displacer.*

The versatility of this unique sensing unit makes possible the measurement of specific gravities over a wide range.

MINNEAPOLIS **Honeywell**

BROWN INSTRUMENTS

For La Choy Food Products...

PERVENAC* LABELING

Gives Both!

Fast, Neat, VERSATILE Labeling Here!

Here's another user who doesn't find a wrinkled label, a "dog eared" label or drop-off since he switched to Pervenac — and what's more important, neither do *his customers!* La Choy Food Products likes Pervenac's *versatility,* too — it labels their different size and shaped containers with speed, positive adherence and no time's lost for glue preparation and clean-up. Remember, this revolutionary heat seal paper is the only label that can be activated and then applied by air pressure to moving glass.

Eye and Buy-Appeal that Build Sales Here!

Because they're always neat, smooth, untorn at the edges and positioned correctly, Pervenac labels give your product a big PROMOTION PLUS at the point of sale. They're a powerful sales help in self-service. They identify clearly. They trade *up* your line. They adhere *firmly* to wet or dry glass, film, metal, paper. Get all the facts — write Nashua or your nearest distributor.

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EXPORT

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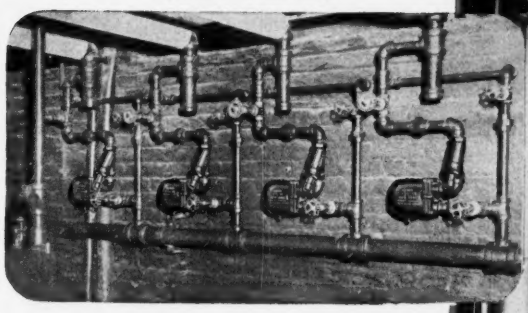
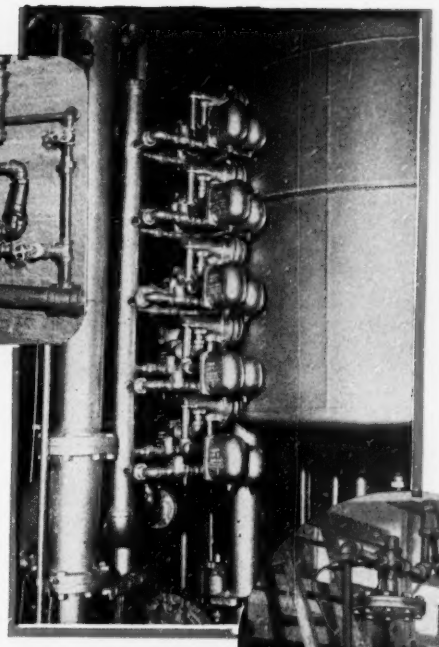
American Paper Exports, Inc.
New York City
UNITED KINGDOM, EUROPE, NO. AFRICA and the NEAR EAST
I. J. Szper, 65 Ave. Niel, Paris

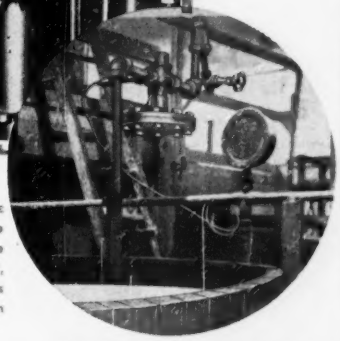
First we make sure of hot, dry steam at the inlet.





Then we select the best of four distinct types of steam traps to remove all condensate without steam waste.

GET YOUR STEAM SYSTEM *Rationalized* WITH SARCO

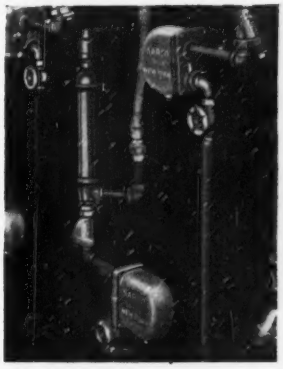


If automatic temperature control is indicated, Sarco can choose from a wide range of self-operated, pilot or electric controls to do the job at minimum cost.

Operating a steam process with maximum efficiency is more than buying a few steam traps and air vents—it is more than haphazardly applying a few temperature controls,

If it means dollars to you in increased production, improved quality and fewer rejects—it will pay you to let the Sarco man near you make a survey of your needs.

He will come up with definite, practical suggestions of how you can do a better job and save steam besides. Write today—there is no obligation.



The new Sarco draining and venting system for dry cans will save at least 20% warm-up time. 307

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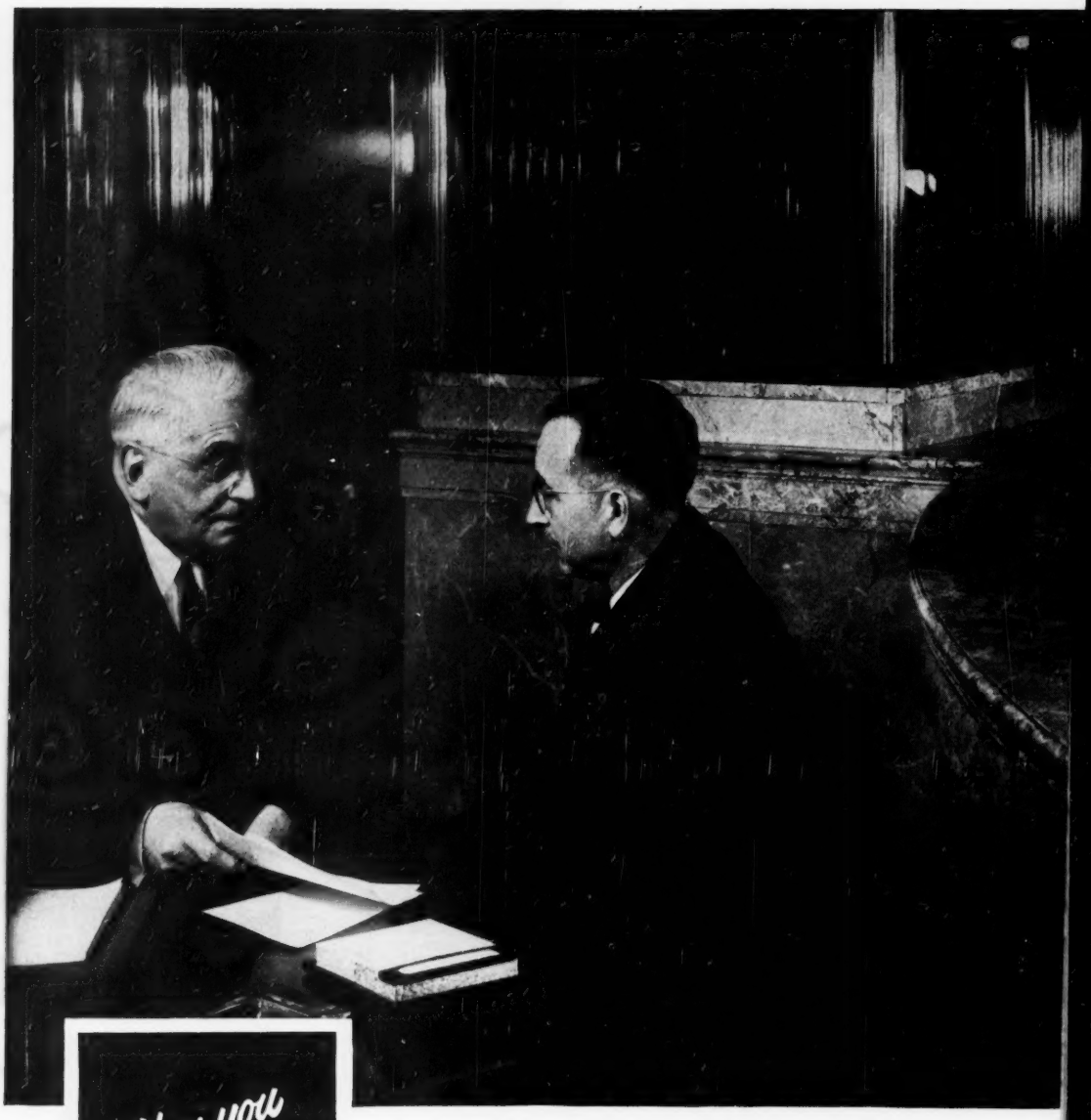


When you want the BEST go to the BEST

And for Packaging it's GLASS

The transparent glass package displays your products with all their colorful eye and appetite appeal. High in chemical durability, it does not change their taste or aroma, will not rust, corrode or leak. Easy to open, easy to use, easy to reseal to protect unused portions, it makes the most convenient package. It lends itself to individuality in size and shape, hence is adaptable to any product. Preferred by consumers because it is sanitary and convenient . . . by retailers because of its sales and merchandising advantages. Anchor Hocking Glass Corporation, Lancaster, Ohio.

Anchorglass*

TUMBLERS

Jellies, jams and preserves lend themselves to tumbler packaging . . . particularly in strong, well designed *Anchorglass* Tumblers. They are the result of consistency in manufacture, uniform distribution of glass, proper annealing and strict quality control from selection of raw materials to finished products. A number of popular styles and capacities are available, one or more of which, we feel sure, will fit your packaging needs. But regardless of what you package there are *Anchorglass* Containers in styles, capacities and colors that will meet your requirements.

ANCHORVAC*

T CAPS

Anchorvac T Caps are used for sealing either thin blown or thin pressed tumblers having straight, flared or bead finish sides. They are suitable for vacuum sealing, hot packing and for sterilization or processing after sealing. Their loose fit before sealing permits speed in application and drawing of vacuum. *Anchorvac* T Caps can be applied with *Anchor* Sealing Machines at speeds ranging from 20 to 125 per minute. They are available in 8 sizes ranging from 54 to 77 mm. Let us tell you more about *Anchorglass* Tumblers and *Anchorvac* T Caps.

*Reg. U. S. Pat. Off.

For the BEST in Glass Packaging *it's*

ANCHOR HOCKING

"THE MOST FAMOUS NAME IN GLASS!"

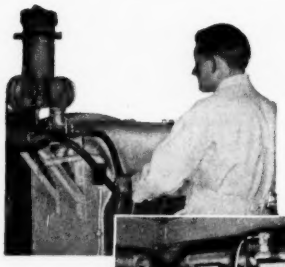
METERS PAID OFF in first month

—REPORTS NEPTUNE USER
R.P. SCHERER CORPORATION
DETROIT, MICHIGAN . . .
World's Largest Producer of Soft Elastic Gelatin Capsules

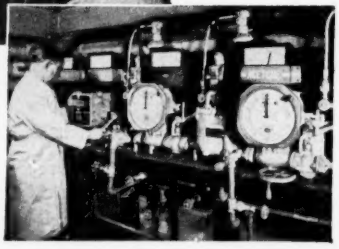
By eliminating possibility of variation and errors in weight of materials, this precise Neptune Meter actually paid for itself in the first month! It measures corn oil into closely controlled batches containing expensive ingredients. It's the new Neptune Model which automatically cuts off the flow at the right quantity.

At right are shown a few of the other Neptune Meters for batching, blending, measuring deliveries, and simplifying cost accounting at R. P. Scherer Corporation. Somewhere in your plant, too, there's a spot where Neptune Meters—small or large—can save time and money. Sizes up to 650 gpm., for handling more than 100 liquids. Famous for simplicity, sustained accuracy, and low maintenance.

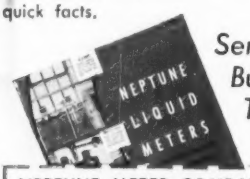
Our engineers will be glad to make recommendations. No obligation—just phone or write the nearest Neptune office for quick facts.



These two Neptune Meters handle glycerine and cold water in blending operation



Neptune Auto - Stop Meters accurately measure naphtha and acetone



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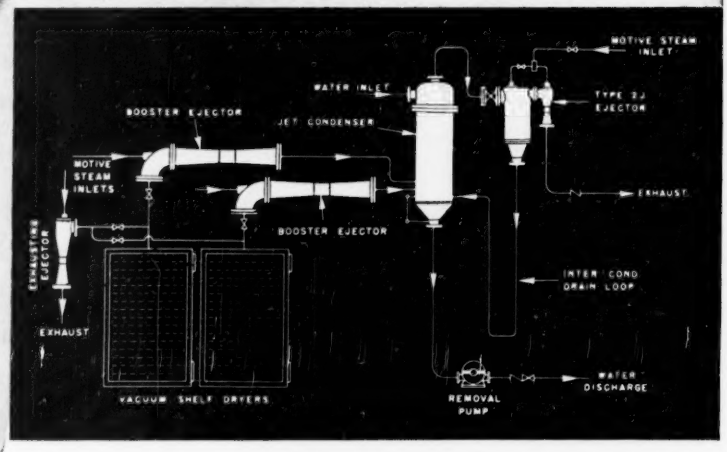

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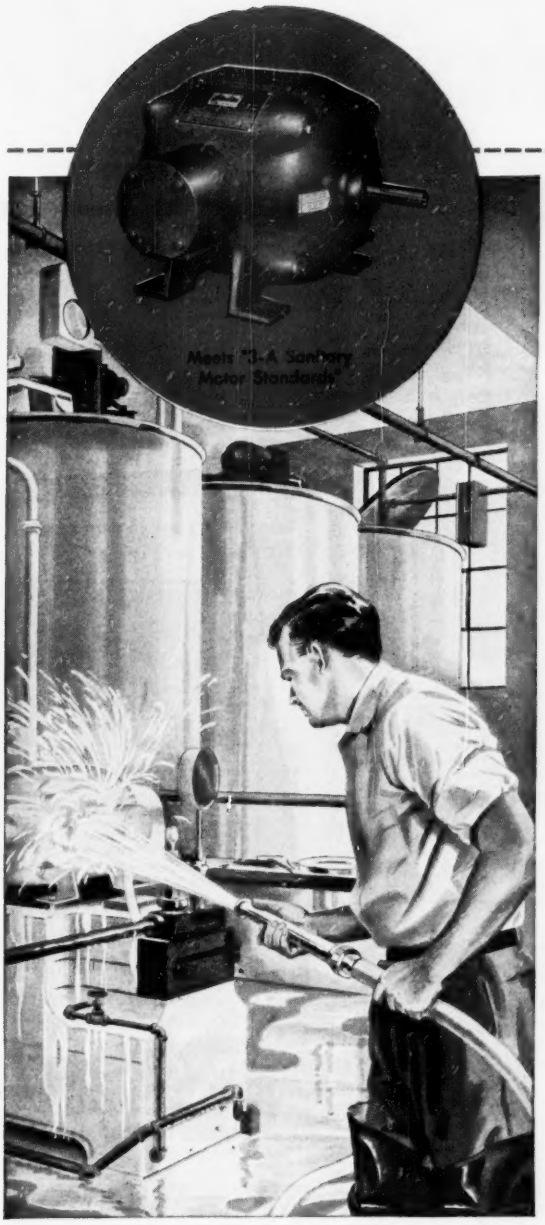

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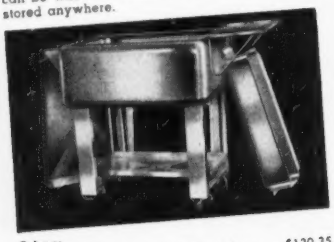

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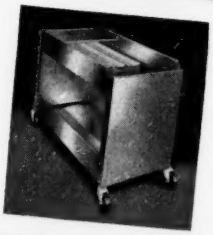

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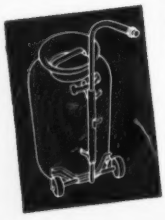

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Food Industries

Food Hurdles Being Taken in Defense Program

As military and civilian aspects of the defense program gain momentum, the overall outlook for the food processing industry continues highly satisfactory. But here and there some difficulties have arisen.

First shock of military food procurement hit canners. Eight weeks after the Korean situation broke, the Oakland QMC had sent out invitations to bid on about ten million dozen cans (No. 2 and 2½ basis) of fruits and vegetables and 312,000 dozen cans of salmon and sardines. Chicago QMC had announced plans to purchase 2½ million dozen cans of fruit, to be delivered at a rate of 5 million cans a month starting in November. It also had on its list of requirements another 17 million dozen cans of fruits and vegetables.

When military buying hit, some of the packers already were sold out. The situation was further complicated by Walsh-Healey requirements for overtime pay on government contracts. Canners operate under a fair labor practice provision allowing six weeks or more of longer hours at regular wages.

And in the face of all this, the government did not have the power to enforce fulfillment of orders.

Very quickly, however, the Office of the Quartermaster General petitioned the Secretary of Labor for an exemption for canners from the troublesome Walsh-Healey provisions. Then Congress passed the Defense Production Bill giving the government authority to obtain what it needs.

Another trouble spot developed when QMC suddenly asked a Western plant to produce 2½ million pounds of dehydrated potatoes. Lack of peacetime demand had put the plant out of operation. So the facilities had to be renovated, some new equipment installed, and men hired to quickly rebuild 6,000 drying trays.

Processors of special ration items had to obtain some new equipment. And canners faced the problem of procoating tins for camouflage. Indications are that all cans will be procoated, regardless of whether destined for overseas or domestic use. But there is a possibility that procoating will be done at ration assembly points—a happy solution to the problem.

There is some confusion as to what might be expected in the next few months in the way of military food orders. Top QMC policy is to buy gradually to avoid impact on the market. But lower-echelon officers may want to build up supplies more rapidly.

There is, of course, uncertainty as to the eventual size of the armed forces. The President puts the figure at three million or more, and international events point to the "or more." Inductions are to be increased from 50,000 a month to 70,000 in November.

Perhaps the best system in keeping up with overall military food requirements is to watch news announcements as to the number of men and apply a little arithmetic. Average daily food requirements for 1,000 men in the Army are: Meats, fish, poultry, 924 lb.; eggs, 184; milk and milk products, 827; butter, 77; other fats, 71; sugars, 282; cereals, 552; legumes, 35; leafy vegetables, 359; tomatoes, 157; citrus fruits, 256; potatoes, 596; other vegetables, 274; other fruits, 356; dried fruits, 41. This totals 4,991 lb. and includes 5 percent kitchen and plate waste, but no other waste.

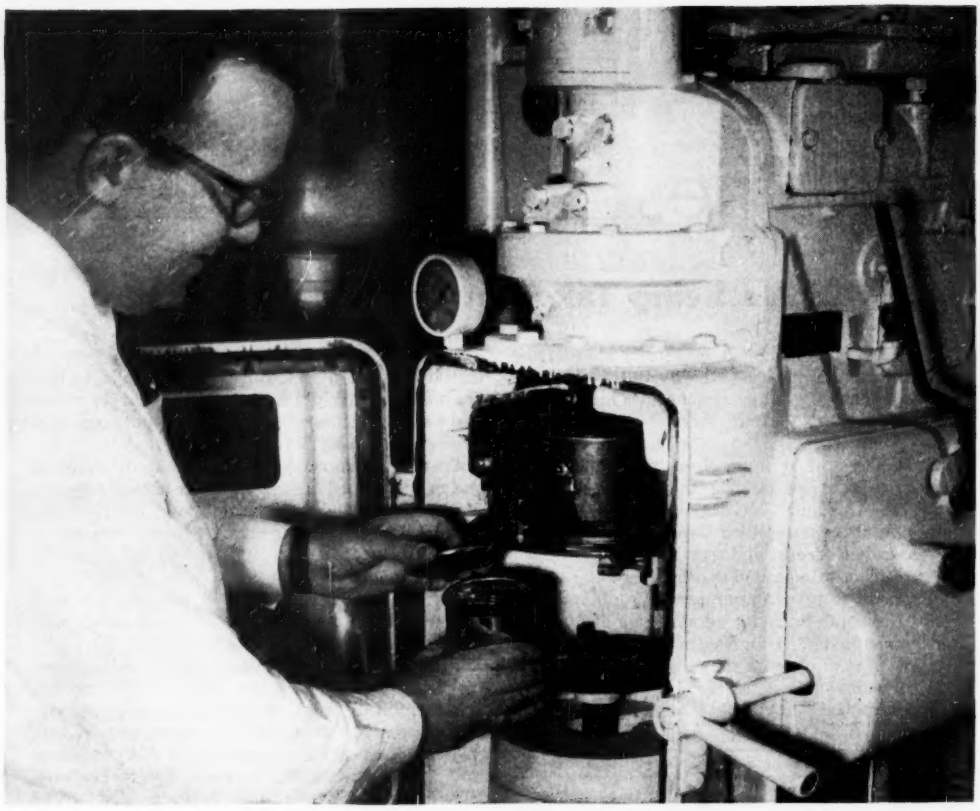
It should be noted, too, that the QMC is greatly interested in dehydrated potatoes and onions, soup mixes, meat and possibly carrots. And while no problem because of their abundance, dehydrated eggs and milk will be used.

In respect to civilian foods, price ceilings are possible but not probable for most items soon. In any event, the Defense Bill provides that a "generally fair and equitable margin" be allowed food processors.

The sugar situation had been brought into hand by procurement of Cuban supplies, plus restrictions on exports. Tin continues in adequate supply.

All in all, the food processing industry is doing well enough. But there remains one general problem: The tight labor situation will get steadily worse as more men are called into the armed forces and as high-paying defense plants outbid the service and soft-goods industries for labor. Even if you hold all your workers, you will be affected by the recent wage raises forced by organized labor.

—F. K. LAWLER, *Editor*



AUTHOR MORSE puts up an experimental tomato pack. "With the technology of low heat-antibiotics canning mastered," he says, "batch processing of such items could be eliminated, time and labor greatly reduced."

Canning With Antibiotics—*Pro* and *Con*

Pointed questions are raised by experimental preservation of vegetables with subtilin and mild heat. True, many advantages are seen. But high hurdles remain before commercial application

ROY E. MORSE
Food Technologist,
Monsanto Chemical Co., Anniston, Ala.

The most exciting possibility to appear before the canning industry in many a moon is the recently suggested method of preservation with antibiotics and mild heat.

The basic idea is not new—anyone who has ever canned even one container has dreamed of a method wherein the addition of a teaspoonful of something, followed by sealing, serves for preservation. A good many years ago there were substances available called "canning compounds" which did just that. And those who used them frequently employed a mild heat treatment as a supplement. Their application, however, was in home canning, not commercial packing, and most of these compounds "went out" because they usually contained boric or salicylic acid.

In the past several months news releases and scientific reports have been telling about the successful canning of vegetables using a combination of 5 to 20 ppm. subtilin, an antibiotic derived from *Bacillus subtilis*, and mild heat consisting of boiling water for about ten minutes. Vegetables that were successfully canned included peas, corn, asparagus, cauliflower, Brussells sprouts, broccoli, wax beans, and mushrooms. Inoculated-pack studies were made with *Bacillus stereothermophilus* and that old bugaboo *Clostridium botulinum*. When correct proportions of subtilin and mild heat were used, the packs remained unspoiled (period reported was eight months).

The possibilities opened up by these

reports seemed so great that it appeared in order to set forth some of the aspects of this novel method of canning. The thoughts recorded below were collected from an informal meeting held during the recent IFT Conference in Chicago, at which some of the foremost canning authorities in the country were gathered.

Advantages of antibiotic preservation canning are almost immediately obvious. Let us run over them: The canner: (1) would thus have available a method which could be adapted to automatic processing at a moderate cost; (2) he could eliminate batch processing, with its inherent high labor cost; (3) he could reduce processing time, on those packs which now require long-time high-temperature cooks, with a consequent saving in steam and labor; (4) he could raise considerably the productive capacity, especially where the processing unit is the limiting factor; (5) he could get products of higher quality from the short-time low-temperature cook; and (6) the resulting low-cost, high-quality canned foods, with potentially higher nutritive value, could prove of tremendous aid to him if he were in the marginal income group of canners. There would, of course, be advantages for all others concerned with canning.

■ "But which antibiotic? There are some 2,000 available now."

But There Are Disadvantages, Too

On the other side of the fence, the picture is a little more difficult to present, because antibiotic preservation canning is in the technical realm of genetics, physics and bacteriology. But this does not diminish APC's importance one bit.

While mild heat canning is highly desirable, there are a number of serious obstacles which must be overcome, and these can only be conquered by tedious investigation. Here are five:

1. In presenting a new method of processing to the canning industry, a record of 100 percent effectiveness, plus a safety factor, must be shown. To date, antibiotics-mild heat does not fulfill this requirement. Some laboratories that have attempted to duplicate the complete effectiveness of subtilin have been unable to do it. This does not necessarily indicate that the method is a failure, however, it does show that this is but the early phase of a whole new concept, and a good deal of know-how is yet to be gained.

2. A point of considerable concern to the men investigating this novel approach is the adaptation of spoilage microorganisms to the antibiotic, or combination of antibiotics used. The ability of organisms to undergo selective adaptation is very well known. To overcome this it would be necessary to resort to combinations of antibiotics, as the medical profession is now doing. But which antibiotics? There are some 2,000 available now. And when one considers that these would have to be tested individually and in combinations against various spoilage organisms, it is easily seen that the task facing investigators is virtually insurmountable.

3. The antibiotics tested to date include subtilin, aureomycin, chloromycetin (chloramphenicol), and lupulon. All have performed satisfactorily. But subtilin was selected because it was readily available and the laboratory doing the work was considerably better acquainted with this material. Virtually all of the workers in the field at the moment feel that those antibiotics which have medical significance have a very limited future in canning. The reasoning is that continued ingestion of an antibiotic might render the consumer insensitive to it in time of need.

4. Another point worthy of consideration is that continued ingestion of an antibiotic could possibly bring about a change in the intestinal flora. However, subtilin has been shown to be a simple polypeptide, and thus is presumably disposed of early in the intestine.

5. Still another phase of this problem which needs considerable cogitation is the proper methodology. The work done to date has shown that it is the purpose of the mild heat to eliminate yeasts and molds and to inactivate enzymes. The antibiotic is used to eliminate the more resistant spores. A very important point here is that the studies made thus far have indicated that the antibiotic used was neither a spore depressant nor a sporicide *per se;* rather, the organisms were eliminated *at the time of germination.*

Briefly, in order for this method to be effective there must be a residue of antibiotic throughout the shelf life of the product. In the work done with subtilin, there was such a residue at the end of eight months.

Heat-Processing Backlog

We have a large backlog of information on heat processing, and we know intimately those organisms which are ever with us as potential troublemakers. The National Canners Association and the various container laboratories have done a remarkably thorough job of characterizing these organisms. But we have no assurance —in fact it is to be questioned— that the organisms which proved troublesome when processing by heat are the same ones that will be resistant to antibiotics-mild heat canning. And obviously the organisms will vary, depending upon the antibiotic under consideration.

This means that an entirely new technic or technics must be evolved in studying this method of canning. The resistant organisms for each antibiotic must be found and characterized. Once you have this in hand there remains the problem of mutation. It may well be that organisms we have long regarded as "weak sisters" in heat processing may become the "bad boys" of this new method.

■ "It may well be that organisms we have long regarded as 'weak sisters' in heat processing may become the 'bad boys' of this new method."

To sum it up, the advantages offered by mild heat-antibiotic processing of canned foods are extremely tempting. But if the canning industry is to continue the splendid record it has now established, a long and careful look is required before plunging headlong into the inviting water.

In an added note, Author Morse points out that his company, Monsanto, is not actively engaged in developing antibiotics for use in the food industry. However, in the course of keeping abreast of food preservation developments it is closely watching the synthesis of chemicals of this type.— The Editors

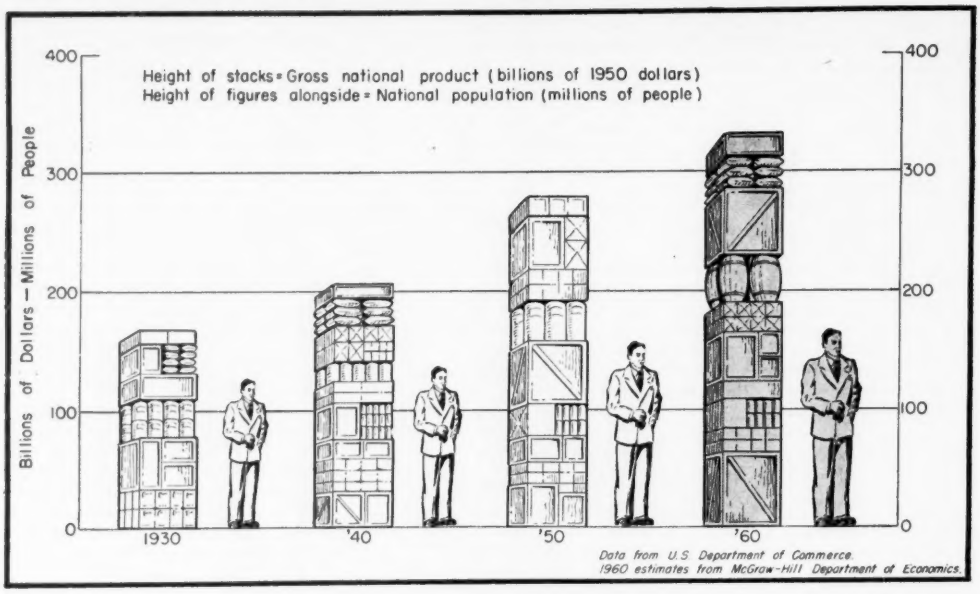
Subtilin Promising in Preliminaries

Researchers at WRRL have packed, and successfully stored for over eight months, more than 700 cans of vegetables using subtilin and mild heat.

The vegetables were prepared as for commercial canning, and weighed into No. 1 cans. Subtilin was incorporated in the canning brine to give various concentrations up to 20 ppm. based on total contents of the can. After vacuum sealing, cans were given a 5 to 20 min. cook in water at 206 to 212 deg. F., followed by water cooling.

After eight months storage at room temperature (some cans were incubated at 122 deg. F.) only the controls and samples having minimum subtilin and heat treatments spoiled. Preliminary evaluations indicate that the quality of the vegetables was quite high.

UP GO TOTAL GOODS AND POPULATION: Your food plans must shift to keep pace



Get Ready for 1960 Food Demands

Trends already apparent point to a food consumption pattern through the '50s that will require important production adjustments come war or no war

ROBERT ULIN
McGraw-Hill Department of Economics

How much will U.S. food consumption increase during the next ten years? What sort of an increase can be expected for your branch of the industry? How high should your company set its long range sales goal?

Despite the current preparedness program, answers to these questions are important to food companies with an eye on the distant future. To get the answers, the McGraw-Hill Department of Economics made an extensive study of business prospects for the next ten years. Here is its report:

1. Consumption of processed food in the United States will probably be about 15 percent higher in 1960 than in 1950.

2. The reasons for expecting this rise are: a. Prospective gain of 10 percent in population. b. Continuing increase in per capita income and in per capita consumption of the better quality foods. c. Steady trend in favor of factory-processed foods and away from home-made items.

3. The primary limiting factor on consumption, over the long term, will be the adequacy of food supplies, particularly livestock products, at reasonable prices. To assure plentiful supplies for our increased population will require careful planning by both farmers and food processors.

4. In a war or near-war economy, incomes will rise faster, and the demand for meat and other favorite foods will soar. Under these conditions, the need for bigger supplies of these foods becomes more immediate and urgent.

Watch Population

The key to future demand for food is population growth. In the past decade, the population of the United States has grown more than in any previous decade, and far more than the population experts believed possible. The wartime surge of early marriages made its special contribution. But population experts attribute most of the higher birth rate to higher incomes and a feeling of greater economic security, leading to earlier marriages and more children. Advances in medical science have also greatly extended the span of life.

It seems reasonable, therefore, to assume that the pattern of relatively early marriage and more children per marriage will persist in this decade. There will be fewer marriages during part of the decade because the extremely low birth rates in the mid '30s will yield a relatively small number of people of marriageable age. However, continued progress against the diseases of old age can be counted on to make its contribution to a large increase in population, although less spectacular than that of the '40s. On these assumptions, we are likely to have 165 to 170 million Americans by 1960, compared with 151.4 million at present.

This population growth will create a steadily rising demand for food. But we can also look forward to higher purchasing power per family. Over a long period, our total national product has

been rising faster than our population. And if this trend continues, the average family income will increase, just as it has in the past. If we merely maintain the long time average increase of 1.7 percent per year in output per man-hour, we can have a gross national product of $315,000,000,000 (in pre-Korea prices) by 1960. And that would raise personal income (after taxes) to $233,000,000,000, an increase of $550 per family.

Income Ups Consumption

How will higher income affect per capita food consumption? If past experience is any guide, consumption will show a noticeable increase. Statistics for wartime and early postwar years prove that as incomes rise people eat more and better quality food—provided, of course, that food prices do not get out of line. It is entirely conceivable, according to the Bureau of Agricultural Economics, that by 1960 the average American will be eating 5 percent more than in 1950. That would raise food consumption 15 percent.

Some individual food products will benefit even more from rising incomes. The long term trend of per capita consumption is strongly upward for meats, eggs, the more popular fresh or frozen fruits and vegetables, and dairy products. On the other hand, it seems unlikely that consumption of potatoes, grain products or sugar products will keep pace with population growth, since these foods have been losing consumer favor over the years.

Another logical result of rising incomes will be strong demand for prepared foods that save work for the housewife. For example, replacement of such home-made items as baked goods and salad dressings by factory products can be expected to continue. Other developments that will meet the demand for greater consumer convenience include prepared dessert and baking mixes, prepackaged meat cuts, frozen fruits, vegetables and seafood, concentrated juices and perhaps similarly concentrated milk, washed and packaged fresh produce. The largest relative increases in food consumption are likely to be for these highly processed items.

The demand for particular foods will be affected by the changing age distribution of our population. In recent years we have had a phenomenal number of new babies and a much bigger market for baby food. During the 1950s these babies will be growing into adolescents, hearty consumers of ice cream, soft drinks and hamburgers. On the other hand, the number of persons in their 20s will decline in 1950-60 because of the low birth rate back in 1930-40. That means there'll be fewer marriages and fewer new babies.

More Old Folks

At the same time, the number of older persons in our population is increasing rapidly because of longer life spans. Researchers are not sure how this will affect food consumption, whether it will favor special foods or just increase the number of people on a regular adult diet.

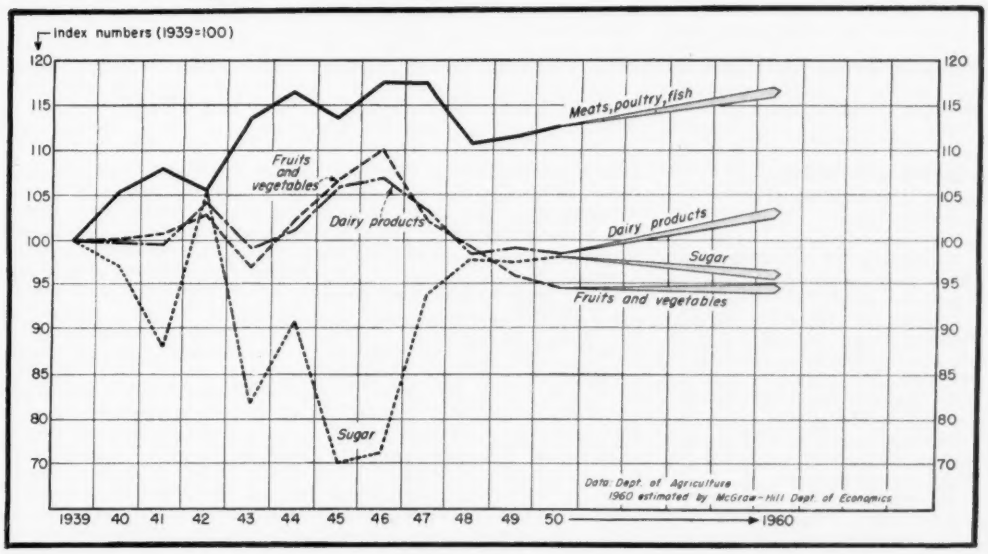
The prospective rise in total food consumption points up a problem for the '50s—getting adequate supplies from the farm. In particular, it will be necessary to increase the supply of preferred foods, such as meat, dairy products and frozen items. These are the things for which the consumption trend is strongly upward.

Meat a Problem

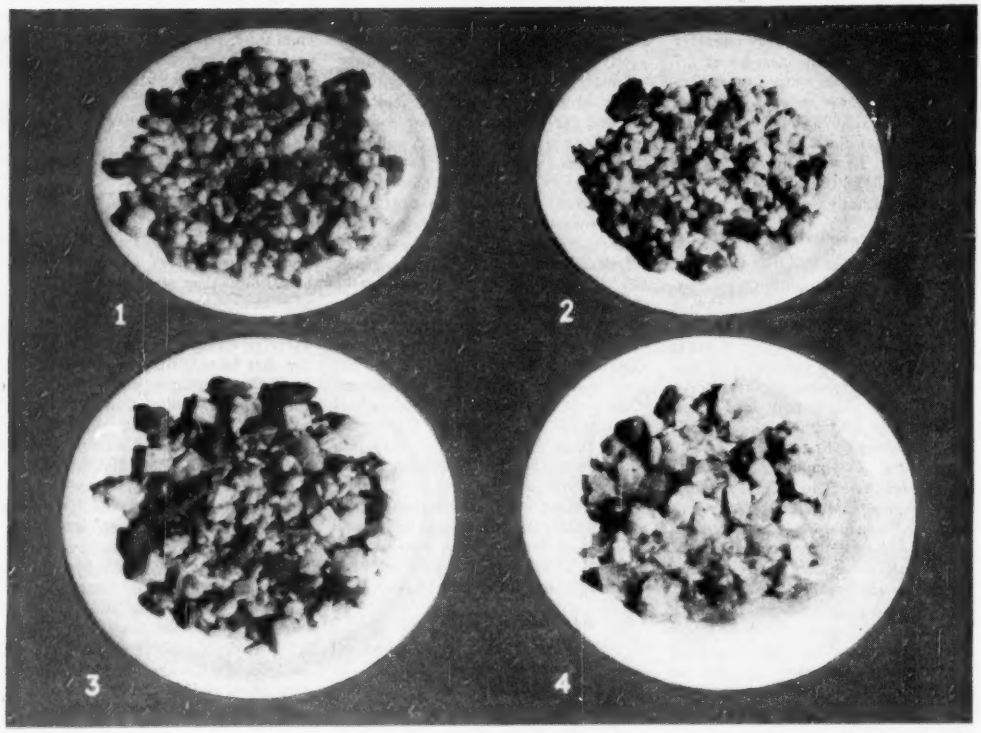
Experience has shown that it is a difficult task to bring about higher livestock production. Farmers hesitate to invest more in beef and pork on the hoof unless they see a good market for some time ahead. Then, too, there is the problem of getting more meat and dairy products in sections of the country that have never specialized in this type of agriculture. In the Southeast, for instance, population is growing rapidly. But livestock products are relatively scarce and expensive. We need more and better distributed production of these foods if we are to achieve the 15 percent potential rise in overall food consumption by 1960.

The time to make a start on this problem is now. In World War II, higher payrolls boosted meat consumption and meat prices. The same thing seems about to happen again. Yet the present prospect is for little more meat in 1951. So it makes sense for farmers, processors and the Department of Agriculture to begin working for an increased flow of livestock products—not just for the present emergency but to keep up with permanently higher demand due to population growth.

Trends in Per Capita Food Consumption



Four Soups Tested by QM



AS THESE lab photos of samples reveal, there's wide variation in the makeup—and hence QM acceptability—of commercial vegetable-beef soups. Goal has been a uniform quality product that several different manufacturers can supply.

Vegetables and Fruits for Our Fighters

Time, distance stringent factors . . . Fresh, frozen, canned compared . . . Advantages of dehydrated items . . . Problems of processing, keeping, and using the foods

JOSEPH R. WAGNER
QM Food & Container Institute for the Armed Forces, Chicago

Average adults do not accept changes in food habits casually, and when they become servicemen they are inclined to demand the same foods they preferred previously as civilians. Hence, the Armed Forces find it advantageous for reasons of morale to include a wide variety of fruits and vegetables in their feeding program. The use of many fruit and vegetable items is further dictated by nutritional and economic considerations.

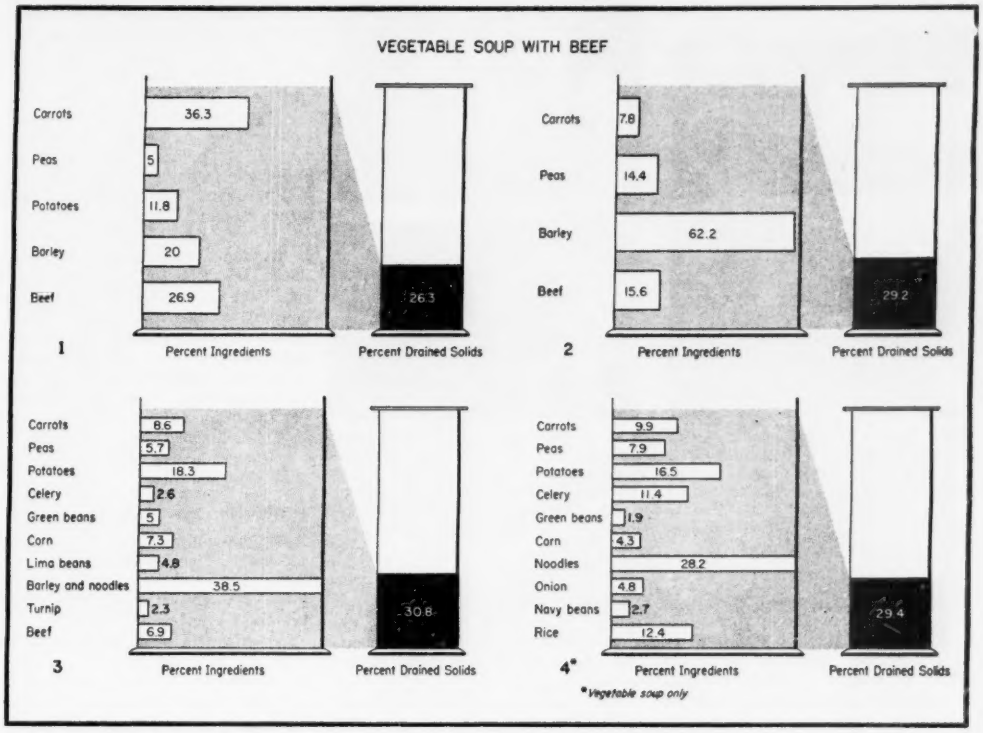
However, bringing these items to the serviceman poses problems which tend to become more numerous and acute as the distance and time from source and date of production increase. When and where circumstances permit, fresh products are generally preferred, but reliance upon processed items is a common necessity.

Frozen products as a class most closely approach the acceptability of the fresh. Elimination of waste, reduced volume, and convenience of preparation are advantages—that must be weighed against the serious disadvantage of requiring continuous low temperature refrigeration, which is costly and frequently unavailable in areas of military operations.

Canned products also possess a high order of acceptability, although many fruit and vegetable items undergo readily discernible changes in canning. Being sufficiently stable, they are used extensively in rations. A distinct advantage is that they are completely cooked and ready to eat with or without heating. An objection is their high water content, which renders them wasteful of transport, storage and critical packaging materials.

Dehydration of fruits and vegetables overcomes many of the disadvantages of other forms. Weight and usually volume are greatly reduced. Requirements for metallic containers are minimized or eliminated. Storage life and stability under temperature extremes are vastly greater than for fresh or frozen counterparts, although further improvements are needed.

Showed These Components



INSIDE STORY of the four samples is told by this diagrammatic breakdown. It's seen there are similarities in percentages of solids in the tested soups. But ingredient proportions quickly indicate why palate appeal differs.

Most dehydrated fruits and vegetables are susceptible to deterioration at high storage temperatures, resulting in off-flavors, changes in color, difficulties of reconstitution, and poor texture or consistency of the reconstituted foods.

The difficulties in reconstitution seriously limit the use of dehydrated foods. Dehydrated fully cooked vegetable products suitable for quick, easy preparation are few in number. Dehydrated, uncooked or partially cooked vegetables are not satisfactory for consumption by the individual soldier isolated from kitchen facilities. Even with adequate cooking facilities, the difficulties of proper preparation contribute to poor results and lower the acceptability of the dishes.

Getting Down To Cases

To clarify the foregoing generalities, let us consider several of the more important problems:

Needed for use in operational rations is a variety of dehydrated soups capable of rapid rehydration in hot water without additional cooking. Some of the variations must be suitable for drinking through plastic sippers for hospital and aid-station use. Others are needed for use by small detachments, also for employment in the Aretic. Quick, easy preparation and conservation of limited supplies of cooking fuel are imperative.

As a partial fulfilment of these needs, the QM Food & Container Institute has recently developed a highly acceptable, completely cooked pea soup that can be prepared in one minute by stirring with water heated to 160-180 deg. F. or by stirring for approximately three minutes with water at 100 deg. F. Rehydration is possible at even lower temperatures. The product is very stable under wide temperature extremes and may be packaged in flexible or rigid containers.

Secret of this soup lies in the porous granule type of particle that simultan-

The Need and The Field

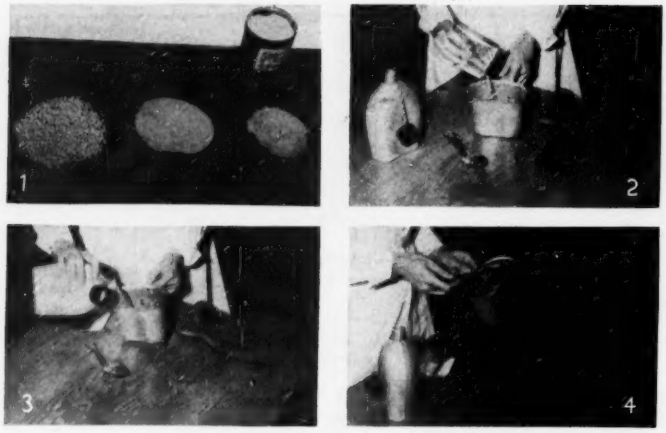
This is the 8th article in a series pointing out the aid industry can give the QM—specifically, cooperation in research coupled with assistance in evaluations of production feasibility.

Each of the articles has detailed prime questions. And as America's armed forces re-gird in the face of critical world developments, every one of these questions has taken on a new, challenging importance.

At this time, then, the reader well may wish to "fill in" on some feature he missed, or review another for further clarification. Accordingly, titles and months of issue of all earlier articles are given below:

QMC Asks Industry Aid (Mar. FI); Meats for the Military: 3 Ways We Can Help (Apr.); Packaging for Combat Conditions (May); How to Make QM "Specs" Work (June); Taste—No. 1 Combat-Food Ingredient (July); What Military Wants in Milk Products (Aug.); and Troops Need Stable Cereal Products (Sept.).

A Good, Simply-Fixed Combat Food



ONLY water, cup and spoon are needed to prepare new powder pea soup. Photo 1 highlights making of powder: Dried peas (left) are cooked to make porous granules, comminuted to fluffy state, and dried (center), then added seasonings and fat complete the product (right). Container holding 15 servings is seen in background. Photo 2: In use in field, powder goes into drinking cup. Photo 3: Water from canteen is added. Photo 4: Mixture is stirred with mess spoon and it's ready to eat.

eously facilitates reconstitution and that prevents lumping during rehydration or formation of a slick pasty soup. Neither extruded nor finely milled dehydrated products provides as complete a solution to these technical difficulties as does the porous granule type.

In preparing the soup powder, smooth round dried peas are pressure cooked for 20 min. at 240 deg. F., producing porous granules. These are then comminuted to a fluffy state, spread in thin layers, and dried to a 3 percent moisture content. During the drying process, peas are in a cabinet shelf dryer for 60 min. Fat and seasonings are then added and the product is screened to break up agglomerates and assure uniform blending. Soup mix is then ready for use or packaging.

The Number 3 container (see photo) holds 15 servings of 1¼ oz. Individual servings packaged separately are readily used by the serviceman in the field. The powder is emptied into a field drinking cup and mixed with 8-oz. of water from the canteen. The issue mess-spoon is the only utensil required. Depending upon heating facilities, the serviceman can prepare a hot, tepid or cool mixture. Only difference will be the length of time required for mixing. With hot water, the desired consistency can be reached in about 1 min. Warm water takes 2 or 3 min. Unheated water can be used but takes an appreciably longer mixing period (5 to 10 min). Regardless of temperature there is no lumping.

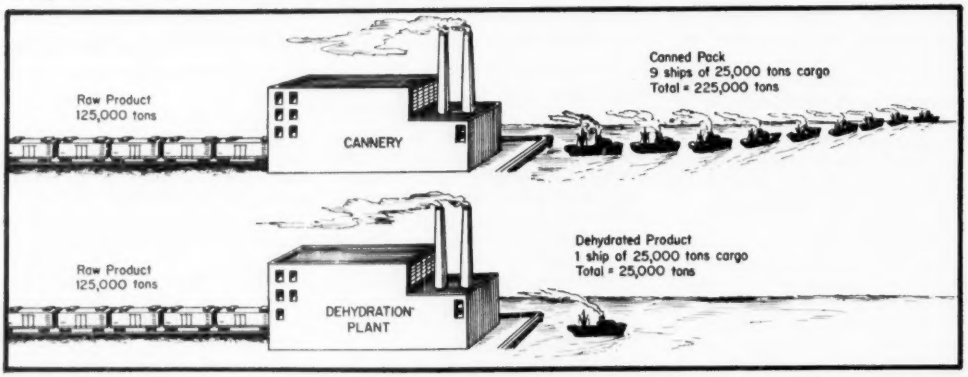
Canned soups needed for special rations have presented a problem which is typical of formulated items whose commercial production involves trade secrets. Nearly every manufacturer of canned soups is extremely reluctant to divulge his formulations, an attitude which is quite understandable in view of the cost of their development and the competitive advantages inherent in their possession. Consequently, there may exist even between top quality brands, considerable differences in the formulas for each type of canned soup. This situation was very difficult to resolve within the legal requirement for governmental purchasing under the competitive bidding system.

Attacking the "Spec" Problem

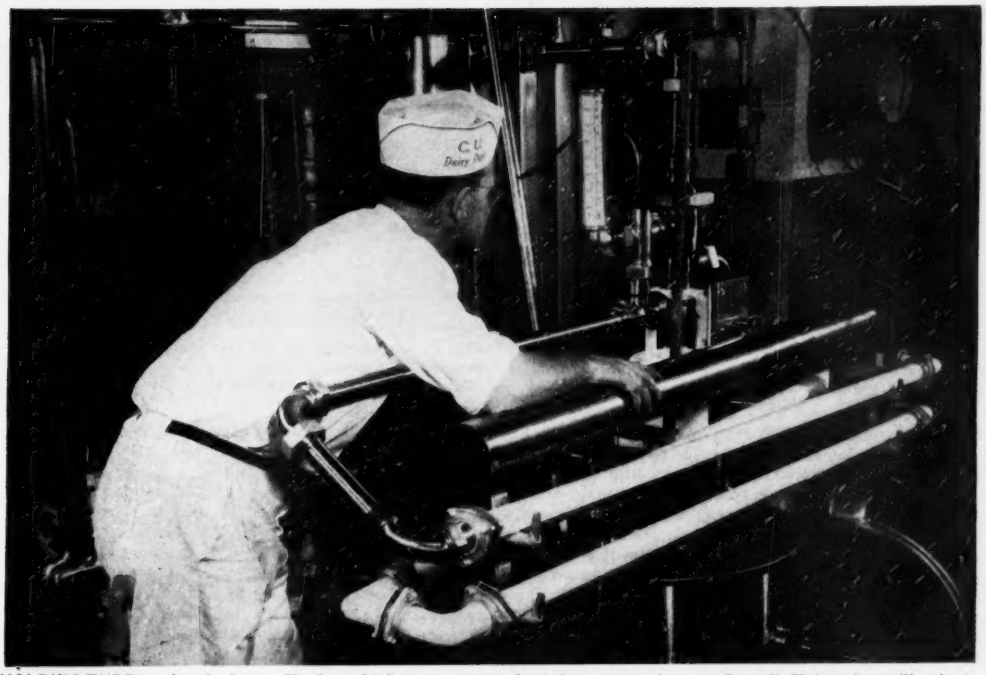
The specification cannot be written sufficiently broad to permit the purchase of any of the good commercial soups on a competitive price basis and yet exclude undesirable products that offer only cost advantages, with insufficient attention given to quality. To resolve this dilemma, specifications are being readied based on formulas which have been evolved and evaluated in cooperation with a committee of food industry technical personnel and submitted to soup manufacturers for review and criticism. These are essentially a compromise of industry formulations, hence do not duplicate any manufacturer's production, but definitely fall within the realm of current manufacturing practice.

(*Turn to page* 186)

Dehydration Can Save 8 Out of 9 Boats



FROM SAME quantity of raw vegetables (corn, peas, string beans, cabbage) comes dehydrated product weighing up to 89 percent less than canned product. Without latter's liquids, packaging and space needs, shipping is notably saved.



HOLDING-TUBE made of glass. Used on high-temperature short-time pasteurizer at Cornell University milk plant, this installation was specially made to determine the adaptability of glass pipe to the dairy industry.

GLASS LINES: Do A-1 Job; No 'Take Down' to Clean

Dairy studies show these installations can be sanitized most effectively, and with savings in both time and labor. Visual inspection is big advantage

F. F. FLEISCHMAN, JR., J. C. WHITE, and R. F. HOLLAND
Department of Dairy Industry, Cornell University, Ithaca, N. Y.

Recent careful investigations have indicated broad new beneficial possibilities for the use of glass piping in the dairy industry.

Granted, the studies are not yet completed. But already these notable conclusions have been reached:

- Glass piping can be cleaned in place—as thoroughly as metal tubing, which must be dismantled daily for washing.
- It has a visual inspection advantage. Whether line has been properly cleaned is immediately noted.
- All told, it offers milk processors considerable savings in cleaning time and labor costs.

A Look At the Problem

Development of satisfactory sanitary pipe and fittings has long been a problem for the dairy industry. A number of metals and metal alloys, have been used in an attempt to prevent oxidized flavor development due to metallic ion contamination and to meet the requirements of health authorities for a smooth, easily cleaned, sanitary pipe.

In 1926, the Corning Glass Works, Corning, N. Y., developed borosilicate glass tubing to transport nitric acid. It was almost immediately adopted for handling not only other corrosive chemicals but also carbonated beverages and some foods as well. It was not until 1941, however, when the War Production Board began to conserve steel, that glass was first used in the dairy industry.

This glass tubing, sold under its "Pyrex" trade-mark, seemed to have numerous advantages to offer the dairy industry. Photomicrography shows (Fig. 1) that the surface of glass pipe is smooth (the dark spots are air bubbles or nonmeltable material imbedded in the glass and not perforations in the surface), while stainless steel pipe (Fig. 2) is rough and grooved by the polishing abrasive.

This led to the idea that it might be possible to clean and sanitize glass in place, eliminating time-consuming dismantling and reassembling. If this proved to be true, the dairy plant operator might realize a considerable saving in labor over the present method of cleaning, which requires milk pipe lines to be dismantled and reassembled daily. Other advantages of glass pipe are that an uncleaned line is easily detected (this is not true with metal pipe) and the glass has no effect on the flavor of the milk passing through it.

With the new possibilities in mind, a project was instituted at the

Photomicrographs Show Glass Is Smooth

FIG. 1. Glass piping proves sleek under the microscope. Dark spots are air bubbles or nonmetallic material imbedded in the glass—not perforations in the surface.

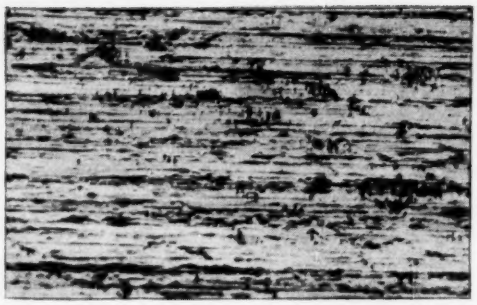


FIG. 2. The surface of stainless steel pipe is rough and grooved as a result of abrasive used in polishing. (Both of the samples were magnified 100 x.)

Department of Dairy Industry, Cornell University, to determine: (1) The adaptability of glass pipe to the dairy industry, and (2) the sanitary condition of glass pipe which is cleaned in place by the recirculation of a cleaning solution, as compared to stainless steel pipe which was dismantled, cleaned, and reassembled daily.

Two methods were used in attacking these problems. The first was a survey of glass pipe already in use in a limited number of fluid milk plants in the New York and New England area. Bacterial samples were obtained and other observations were made in three plants on three different occasions approximately one month apart. Two visits were made to a fourth plant.

The second method was to install glass pipe in a few dairy plants in or near Ithaca, N. Y., and make a specific study of these installations. Three lines were set up in the commercial milk plant at Cornell University and another three lines at the Geneva Milk & Cream Co. plant in Geneva, N. Y.

Installation of glass pipe at Cornell, Geneva, and in all of the plants surveyed was somewhat difficult in that all pipe hangers and brackets had to be hand made. This situation will be alleviated soon, however, because new hangers and brackets of sanitary type are being designed by one of the large dairy equipment manufacturers.

Pipe installation consisted of first mounting metal flanges on each length. The lengths were then fastened in place with wire or string, the interface rubber gaskets were placed between each length of pipe, and the flange bolts inserted and tightened snugly. Hangers and brackets were then made and mounted. In putting these in, one end of the line was securely fastened and then each consecutive hanger was installed until all were in place.

Three types of stainless steel adaptors can be used to clamp the glass rigidly to the hangers. These are: (1) The 10 PX adaptor (Fig. 3), which consists of a 3A nut and ferrule to connect to stainless steel; (2) the 20 PX adaptor, which is threaded to connect to stainless steel; and (3) a short length of stainless steel sanitary pipe with a 3A ferrule on one end and Corning's stainless steel glass-to-tubing ferrule on the other (see Fig. 4).

Hangers at each end of the glass line must be rigid to hold the adaptors securely. Additional supporting hangers are required every 8 to 10 ft. along the line to prevent sagging and vibration. Wherever glass connects to stainless steel sanitary pipe or to other equipment, the adaptor must be fast-

Adaptors Provide Support For the Tubing

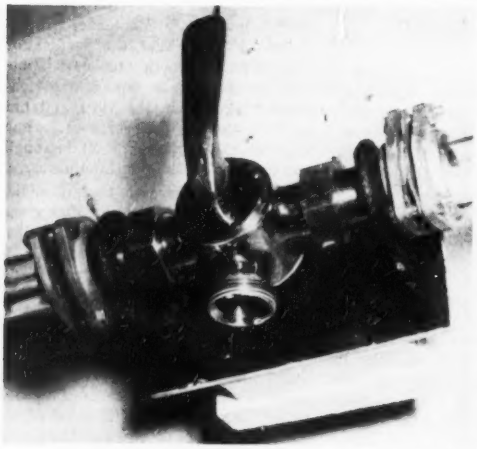


FIG. 3. The 10 PX adaptors for valves each consist of a 3A stainless steel nut and ferrule connected with Corning's special stainless glass-to-tubing ferrule.

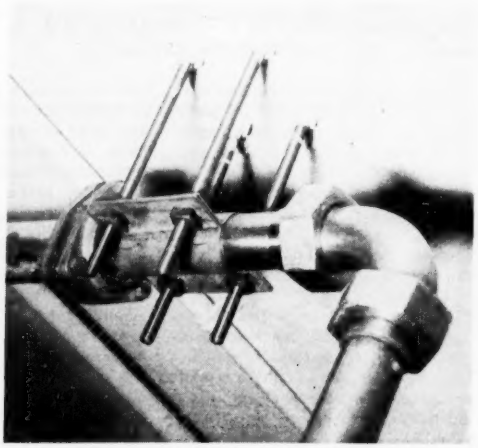


FIG. 4. A shop-made adaptor employs a short length of stainless steel pipe with a 3A ferrule on one end and the special Corning ferrule on the other.

ened securely to prevent torque from being transmitted to the glass while it is being connected to, or disconnected from, the equipment or other lines.

In some installations it was necessary to cut and fit glass pipe on the job in order to obtain the correct lengths. Joints made in this manner are usually called field-cut joints. In making these, the pipe is first cut with a hot wire and then heated with a flame from a gas and oxygen mixture until the glass softens. The pipe is then rotated rapidly until the flowing glass forms a beaded end.

Such field-cut joints are not common, however, since they are not needed if the piping requirements for a job are properly planned before installation.

Gasketed Joints Get Attention

In studying the cleaning of glass lines, it seemed reasonable to believe that if any bacterial build-up were to occur, over a period of time, it would be observed at the gasketed joints where the two lengths of glass are joined. Therefore, the bulk of the bacterial data was obtained from the gaskets and the glass adjacent to them.

Moreover, all glass milk lines are fastened securely at each end with stainless steel adaptors and all stainless steel valves are connected to the glass by stainless steel adaptors. These were also points where bacterial build-up might occur and were also studied.

Here we should insert a word of warning—whenever a joint is opened to obtain bacterial counts, the gaskets must be discarded and replaced with new ones. There appears to be a "cold flow" of the material once it is installed in the line. If the gasket is removed and then reinstalled, the material may crack and it is conceivable that milk solids might be trapped in the crevice.

Fig. 5 shows three gaskets: Gasket A was in service for a week and was removed and reinstalled three times in that period; Gasket B was in service for a year in the same line, but was never removed during that time; Gasket C was in use for a month and was reinstalled eight times.

Bacterial samples from the stainless steel pipe already in use in the plants were taken as controls. These control samples were obtained at random after the pipe had been dismantled, cleaned, sanitized, and reassembled.

In an effort to preserve usual plant operating conditions, the methods of cleaning and sanitizing were left to the discretion of the plant operators. In this way we obtained information under actual operating conditions. Thus the data collected are practical rather than purely experimental.

To obtain the bacterial samples from the inner surfaces of the glass pipe, gaskets, and stainless steel pipe, a 9-in. stiff wire swab was used. This was made of a twisted double strand of 14 gage (B and S standard) wire plated with molten tin. The swab was ¾ to 1 in. in length and 3/16 to 5/16 in. in diameter. It was wound with non-absorbent cotton, inserted in a 16 x 100 mm. bacteriological test tube, plugged with cotton and sterilized. Blanks, each containing 10 ml. of a sterile phosphate buffer solution of pH 7.2, were prepared according to standard methods[1], and poured into the test tube containing the sterile swab just prior to the swabbing of the pipe.

Swab samples were taken at the pipe elbows by removing the elbow, swabbing the inner surface of each of the two gaskets (see Fig. 6), and then the inner lip of each section of the glass (see Fig. 7 and 8). A separate swab was used for each of the samples. Each elbow removed gave a total of two gasket and four glass samples. The inner surfaces of the stainless steel adaptors at each end of the lines were also swabbed.

Joint Dismantling Breaks Down Gaskets

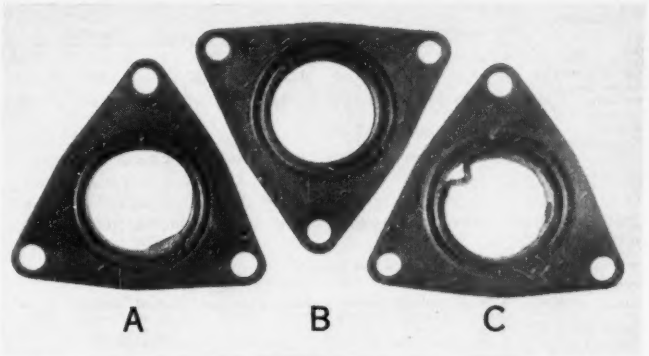


FIG. 5. Disassembling has bad effect on gaskets. Those at (A) and (C), respectively, were removed and reinstalled three times in one week, and eight times in one month. Gasket (B) was in service one year before removal.

How Bacteria Counts Were Made

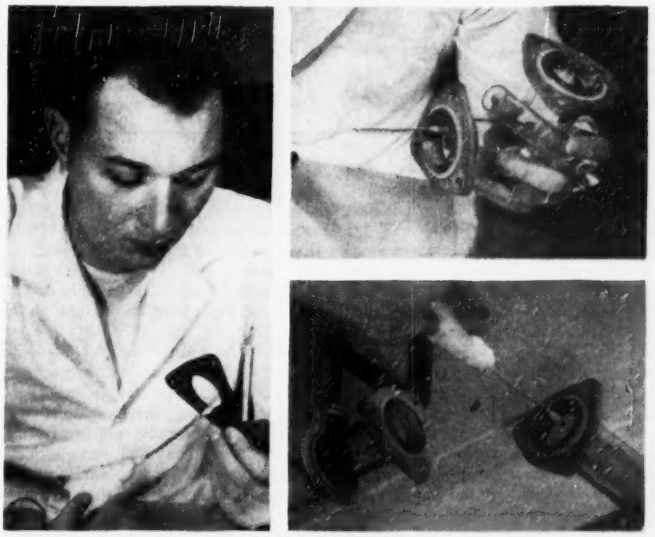


FIG. 6, 7, 8. Author Fleischman shows sampling procedure. An elbow was removed and (left) inner surface of gaskets is swabbed with cotton. Next comes swabbing of inner lips of glass elbow (top right), then of glass piping (lower right).

TABLE I—BACTERIOLOGICAL Survey of Four Milk Plants Supports the Case for Glass Pipe

	Stainless Steel Adaptors					Rubber Gaskets					Glass Pipe				
Plant	1	2	3	4	Total	1	2	3	4	Total	1	2	3	4	Total
Number of samples	4	4	..	9	17	5	1	5	9	20	9	8	20	17	54
Number showing no colonies	0	2	..	1	3	1	1	1	1	4	5	2	12	3	22
Highest number per plate	16	3	..	300+	..	4	0	7	300+	..	4	12	5	300+	..
Average number per plate	5.2	0.6	..	80	..	1.6	0	2.3	180	..	0.5	3.5	0.6	88	..
Samples showing +coli	0	0	..	0	..	0	0	0	0	..	0	0	0	3	3

TABLE II—HOT WATER Sanitizing Gave Good Bacterial Reduction at Cornell and Geneva

	Raw Milk Lines					Pasteurized Milk		
	St. Steel Control	St. Steel Adaptors	Rubber Gaskets	Glass Pipe	Glass Pipe, Field-Cut Joint	St. Steel Adaptors	Rubber Gaskets	Glass Pipe
Number of samples	70	78	191	374	21	46	66	136
Number showing no colonies	19	26	102	227	12	26	45	92
Highest number per plate	300+	300+	14	32	2	300+	4	3
Average number per plate	43	15	0.7	0.4	0.3	15	0.3	0.3
Samples showing +coli	5	2	0	0	0	0	0	0

TABLE III—AVERAGE COUNTS MOUNTED When Glass Lines Were Sanitized With Quaternaries

	Cornell Raw Line			Geneva Raw Line			Geneva Pasteurized Line		
	St. Steel Adaptors	Rubber Gaskets	Glass Pipe	St. Steel Adaptors	Rubber Gaskets	Glass Pipe	St. Steel Adaptors	Rubber Gaskets	Glass Pipe
Number of samples	10	16	32	16	26	52	18	18	36
Number showing no colonies	2	3	14	6	17	38	12	9	25
Highest number per plate	300+	300+	300+	76	300+	18	300+	23	18
Average number per plate	68.6	135	59	8.1	16.4	1.4	16.8	1.7	1.0
Samples showing +coli	3	1	1	0	0	0	0	0	0

TABLE IV — COUNTS Were Low When Lines Were Sanitized With 200 Ppm. Chlorine

	Cornell Raw Milk Line		
	St. Steel Adaptors	Rubber Gaskets	Glass Pipe
Number of samples	10	40	70
Number showing no colonies	9	30	57
Highest number per plate	1	3	2
Average number per plate	0.1	0.4	0.2
Samples showing +coli	0	0	0

TABLE V—RESULTS Were Good When Glass Holding Tube On the HTST Pasteurizer Was Cleaned Without Dismantling

	St. Steel Adaptors	Rubber Gaskets	Glass Pipe
Number of samples	72	72	144
Number showing no colonies	31	41	89
Highest number per plate	21	5	7
Average number per plate	1.0	0.5	0.2
Samples showing +coli	0	0	0

TABLE VI—TESTS SHOW Bacteria Count of Pasteurized Milk Does Not Increase In Glass Piping

Vat Number	Sample Number	Bacterial Count Entering Line	Bacterial Count Leaving Line
1	1	2,900	2,800
	2	2,500	2,800
	3	2,500	2,200
	4	3,900	3,400
	5	4,300	4,500
	6	3,800	3,200
	7	4,500	5,100
	8	2,700	2,200
2	9	2,300	2,300
	10	2,200	2,200
	11	2,500	2,200
	12	2,400	2,500
	13	2,200	2,100
	14	2,700	3,000
	15	2,400	3,000
	16	2,800	2,300
3	17	1,200	1,200
	18	1,000	1,000
	19	1,000	1,100
	20	1,300	1,000
	21	1,500	1,100
	22	2,100	1,500
	23	2,400	1,700
	24	1,500	1,600
4	25	30,400	31,200
	26	41,000	40,000
	27	26,000	29,000
	28	34,800	33,400
	29	26,000	27,200
	30	39,200	36,000
	31	29,200	27,200
	32	24,400	28,000
5	33	1,500	1,700
	34	1,400	1,200
	35	1,500	2,100
	36	1,300	1,200
	37	1,500	1,500
	38	1,400	1,600
	39	1,500	1,300
	40	1,600	1,400

In making a test, the swab was removed from the sterile buffer solution and the excess solution was squeezed out along the inside of the test tube. The swab was then rubbed slowly and firmly three times over the surface tested, reversing the direction each time. It was then returned to the test tube containing the 10 ml. of sterile buffer and whip rinsed (each tube was shaken with a rotary motion 50 times in approximately 10 sec.). After this the swab was removed from the buffer solution, with the excess liquid again squeezed out along the side of the test tube. Once more the swab was rubbed over the same surface in the manner previously described, and then returned to the test tube. The buffer solution was plated within an hour or refrigerated at 40 deg. F. and plated later. This period between swabbing and plating was never longer than 24 hr.

Just prior to plating, the swab was again whip rinsed, as described. Portions (1 ml.) of the 10 ml. buffer solution were plated on two plates each containing 10 ml. of skim milk agar, and 1 ml. was plated on a single plate containing 10 ml. of desoxycholate agar. All samples were incubated at 37 deg. C. for 48 hr. and then counted.

The observed fact that many agar plates and many samples failed to show any colonies did not prove, or even indicate, that the sample was actually sterile, but it definitely indicated that these samples were relatively free from bacteria. In some cases, however, the plates contained more than 300 colonies and could not be counted accurately. Wherever this occurred the figure 300 was used in computing the average. Therefore, the average colony per plate is slightly lower than it should be wherever counts of 300-plus are indicated.

Hucker and Thomas[2] have shown that the bacterial count of milk did not increase upon being passed through glass pipe. In an effort to corroborate their findings, pasteurized milk samples were obtained at the inlet and outlet ends of the glass pipe and plated at a 1 to 100 dilution on standard skim milk agar and on desoxycholate agar, according to standard methods[3].

Throughout the experiment, the cleaning solutions for both the stainless steel and glass lines were prepared by the plant workmen. At no time did these men weigh the cleaning powder, or measure the amount of water or its temperature. Therefore, all concentrations mentioned are the manufacturer's

recommendations and were subject to considerable variation.

Milk Plants Studied

The four plants surveyed in New York City and New England are indicated by the numbers 1, 2, 3, and 4, for purposes of this discussion. Results obtained are shown in Table I.

Plant 1 had a 3-in. glass raw milk line handling all of the milk coming into the plant and a similar line running parallel to it for circulation of the cleaning and sterilizing solutions. At the time of the survey, this line had been in use for approximately six months. It was cleaned by first flushing with cold water, then recirculating an alkaline cleaner at 160 deg. F. for 15 to 30 min. The pipe was then drained and sanitized by rinsing with a 200-ppm. chlorine solution.

Plants 2 and 3 had 4-in. raw milk lines which had been in use for over two years. Both plants had double lines for circulation of cleaning solutions. These lines were cleaned by flushing with cold water and then recirculating an alkaline cleaner at 160 deg. F. for 15 min. or longer. In plant 2 the lines were sanitized by circulating water above 190 deg. for 15 min., while Plant 3 used 190 deg. water for 15 min. and following this with an injection of live steam.

Plant 4 had both 2-in. and 4-in. glass raw milk lines that had been in use for over three years. These were cleaned by flushing with cold water, then running an alkaline cleaner at 160 deg. F. through them and finally sanitizing with a 200-ppm. chlorine solution.

The only lines studied which were not satisfactorily cleaned and sanitized were those in Plant 4. Here, it was noted that the vat used for mixing both the cleaning and sanitizing solutions was so small that it did not hold enough of the solution to fill the lines completely. With this condition existing, and since no provisions were made for recirculation of these solutions, it was not possible to have either the cleaning or sanitizing solutions contact all of the pipe surfaces. The lines were never completely filled.

Experimental Installations

Three 1½-in. glass lines were, as stated, installed at the Cornell University milk plant and three lines of the same size at the Geneva Milk & Cream Co. plant. At Cornell, we had one glass raw milk line, one glass pasteurized milk line, and a glass holding tube on the high-temperature, short-time pasteurizer; whereas the Geneva plant had two glass raw milk lines and a glass pasteurized milk line.

Cleaning procedure of raw and pasteurized milk lines at both plants

(*Turn to page* 182)

Wide World photo

LENGTHS OF DOUGH are fed into holders. Then knife cuts slices that drop on trays and go (rear) to oven heated by battery of infra-red lamps

Cookies Cut and Baked Continuously By Specially Designed Machines

Mass output attained as slices are snipped 12 at a clip and are automatically fed to infra-red lamp oven—first of its kind

THROUGH ingenuity in designing two machines—an automatic dough slicer and a special infra-red lamp oven—more than 300,000 ice-box cookies are now being produced daily by Skokie Valley, a small cookie plant at Skokie, Ill.

Roy E. Wyle, president of the company, is credited with developing the two new units. They work together in a line operation.

The new slicing machine was devised after numerous other cutting machines were tried and found unsatisfactory. And the infra-red lamp oven is reported to be the initial one of its kind for baking cookies.

Specifically, the slicing machine incorporates a dough holder (comprising twelve semi-circular, stainless steel, vertical flutes) and a Swedish hard steel blade that is 30 in. long and 3½-in. wide.

Twelve pieces of kneaded dough, rolled to length by hand, are loaded into the multi-holder. Then the knife gang-cuts the twelve gravity-fed lengths (see photo) into slices. Motion of the knife is directed by cam-action. As the slices are cut, they drop onto a tray carried below the knife by two chain belts. Each stroke of the knife forms one row of a dozen slices of dough.

After the tray is full, the knife automatically stops long enough so that twelve slices of dough cut by the next stroke of the knife fall into their proper place on the next empty tray.

Speed of the knife can be quickly adjusted from two strokes a second to one stroke every five seconds.

Trays are conveyed to the new 34-ft. long oven, where the cookies are baked in 5½ min. by a battery of the infra-red lamps. There are eight series of lamps—32 of them to a group. Separate controls for each series of lamps automatically regulate the oven temperature and baking time.

Speed of the oven and slicing machine is synchronized. Since thickness of the slices of dough will vary baking time requirements, speed of the conveyor carrying the slices through the oven is regulated accordingly.

The oven conveyor is electrically driven. Its rate of travel is controlled by a variable speed motor.

How It Was Saved—Ways *You* Can Apply

These Ruppert-Plant Water Measures Conserve . . .	This Gallonage Yearly
1. Utilizing bottle-washer rinse water in pasteurizer cooling compartment	24,000,000
2. Collecting condensate from more unit heaters and evaporators	9,800,000
3. Running air-compressor cooling water to cooling tower make-up tank	7,000,000
4. Running air-conditioning cooling water to cooling tower make-up tank	4,000,000
5. Collecting and recirculating cooling water for ash pit doors and coal mills	5,000,000
6. Re-using water collected from mash filters	5,000,000
7. Salvaging overflow from regular hot water storage tanks	4,000,000
8. Operating filter-mass presses on air instead of water	3,000,000
9. Supplying toilet bowls and urinals from cooling tower make-up tank	700,000
10. Rigidly controlling water softener back-washing time	900,000
11. Installing automatic and hand-valve shut-off nozzles on hoses 12. Testing sprinkler system at small bypass connections 13. Constantly reminding brewery workers to save water	8,600,000
Total Water Saved Yearly	72,000,000

Percentage of Water Saved	*25.5%*
Yearly Saving in Water Bill	*$15,000*
First Cost of Extra Installations	*$ 5,000*

They Cut Their Use of Water 25%

Ruppert really engineered a double benefit—an annual 72,000,000 gal. for water-scarce New York City and $15,000 for itself. Total outlay: $5,000

HAROLD TRAVIS
Plant Engineer,
Jacob Ruppert, New York City

Jacob Ruppert brewery in New York City responded to the urgent call for water conservation late in 1949 by effecting a 25 percent saving in water for the first six months of 1950. That means 72,000,000 gal. a year more for the city's hard-put reservoirs, plus an annual $15,000 extra in the company's pocket.

And if your own plant has any sort of refrigeration system, power plant, washing operation, air conditioning unit, or filtering or other H_2O-using equipment, it's a good bet that a check on what Ruppert did will turn up a cash- and water-saving idea for you.

Latest available figures show that the brewery used an average of 5.74 bbl. of water per bbl. of beer produced in the first half of 1950. This is a 25.5 percent decrease from the average 7.70 bbl. of water during the whole of 1949. The projected yearly saving is over $15,000—minus the surprisingly low equipment installation costs of $5,000 in the first year.

Department Heads Met Weekly

Under the leadership of Fred M. Linder, Company president, and J. Gordon Morrow, production manager, representative members of all departments in the plant having to do with use of water were authorized to look into any and all means of conserving the valuable liquid. Attending periodical conferences with the production manager were the heads of the following departments: Engineering, maintenance, laboratory, bottling, brewery, safety, warehousing and traffic. Each department head then held weekly meetings with his key personnel to further discuss ideas for water conservation.

Company then adopted those water saving measures which (1) could have no ill effect whatsoever on the final beer product, and (2) were justifiable from a cost standpoint.

Utilize Bottle-Washing Water

The largest individual saving came in utilizing bottle-washer rinse water in the pasteurizer cooling compartment make-up tank. This has yielded over 10,000,000 gal. in the first half of 1950, and recent improvements should send the water saving to over 24,000,000 gal. for this year.

Previously, fresh-filtered city water was used for rinsing in the last compartment of the bottle washer, then run down a sewer. Now, a small plant-fabricated tank with a perforated tray to catch any extraneous labels, and such, collects this water. A pump was installed to send it over to the pasteurizer on the same bottling line (there are five bottling lines in all).

Water emerges from the washer at about 70 deg. F. in summer and 40 deg. F. in the winter. It is pumped to the pasteurizer, where it is first

used for the final cool of the beer. It is then circulated through the heating and preheating sections. Since the winter temperature is just about right for the cooling compartment no additional city water has to be added. But in summer, about 20 gpm. maximum of cold city water supplements the washer water. The pasteurizer formerly required about 60 gpm. of fresh water in the summer and 40 gpm. in the winter months.

It takes 55 min for bottled beer to move through the pasteurizer. Therefore, the first water from the washer cannot be utilized in the pasteurizer until about 55 min. after the former begins a day's operation. And at the end of the day, the washer shuts down 55 min. before the pasteurizer. This means 55 min. worth of washer water lost at the beginning and end of each day. The brewery is investigating means for salvaging some of this water.

Get 15 Percent More Condensate

The second largest saving resulted from a careful check on all unit heaters, evaporators and other equipment using steam. It was found that condensate from many more of these units could be collected and returned for boiler feed, rather than run down the drain. This yielded 15 percent more condensate, thus reducing city water make-up to the steam generating units.

Formerly, 55 percent of the condensate was returned, now 70 percent. Most of the other 30 percent is lost in mash tubs and cookers and in bottle pasteurizers and fuel oil heaters. The power plant produces 1,200,000 to 1,500,000 lb. of steam a day. Extra 15 percent saved totals 9,800,000 gal. a year.

Another big saving is realized by piping the cooling water for the air compressors in the fermenting cellar to the cooling tower make-up tank. This nets 30 gpm., or around 7,000,000 gal. a year. Installation required only additional piping.

Also re-used for cooling tower make-up is cooling water from the large air conditioning units in the brewery's main office. About 40 gpm. are saved, a yearly yield of 4,000,000 gal.

A water saving of 10 gpm. was effected by collecting and recirculating water used for cooling ash pit doors and coal mills in the power plant. This amounts to 5,000,000 gal. a year.

About 80 bbl. of water per brew is conserved by collecting and re-using water remaining in the filters after the mash-filter operation, instead of letting it run down a sewer. This totals 5,000,000 gal. a year.

Storage Tank Overflow Eliminated

In order to conserve all of the water used during the wort-cooling operation, additional tanks have been tied in to catch overflow water from the regular hot water storage tanks. About 4,000,000 gal. of water a year will be saved in this manner.

Four cylindrical 43,000-gal. tanks are used for storing this water. Previously the hot water was used as process water, for washing kegs and tanks, and cleaning floors and toilets. Now, in addition, it is being employed for flushing hop leaves from hop jacks, washing trucks, cooling tower make-up (about 6 percent needed), and power plant boiler make-up.

Incidentally, the brewery has a very economical arrangement for getting its hot water. The water is taken from city mains at temperatures of 40 to 70 deg. F., varying according to the season. It passes through sand and charcoal filters and is pumped over a 300-ton zig-zag ammonia cooler to bring temperature down to 33 deg. F. The cold water passes through a double-pipe counterflow cooler and cools the hot wort down from 212 to 50 deg. F. The water discharges at 135 deg. F., passes through a steam heater that brings temperature up to 160 deg. F., and then goes to the hot water storage tanks.

Saving of another 3,000,000 gal. yearly is credited to a change in the filter mass presses in the filter cellar. They now operate on air, instead of water.

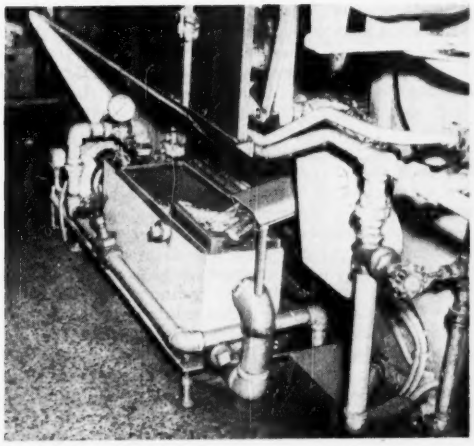
A relatively small, but nonetheless important, water saving is made by supplying the toilet bowls and urinals in the power plant with cooling tower make-up water instead of city water. Figuring on the basis of 110 men using 20 gal. a day, this saving comes to 700,000 gal. annually.

Achieved with no investment in equipment is a water saving effected by reducing the back washing time on Permutit water softeners by one-third, and by allowing more water to pass through before back washing. It is stressed that quality of the softened water does not suffer, being a case where more stringent controls are employed than when water was plentiful.

Back washing time is rigidly set at 20 min., where before it averaged 30 min. Washing requires 90 gpm. And

(*Turn to page* 184)

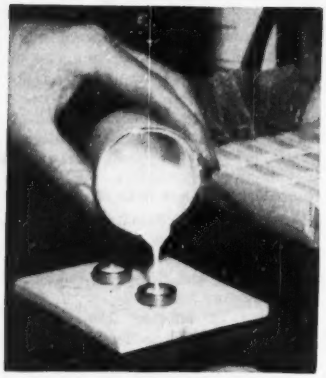
Just a Little Thinking, Simple Changes, Small Expense



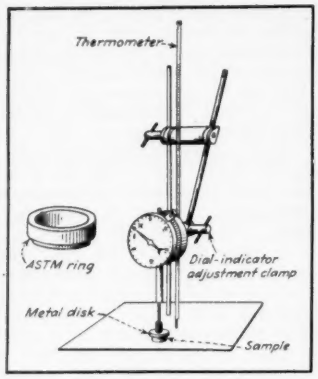
HERE, plant-fabricated tank with perforated tray catches washer rinse water, conserves 24,000,000 gal. yearly.

AND HERE, worker releases thumb, water's shut off. New nozzle saves plenty—no more running hoses.

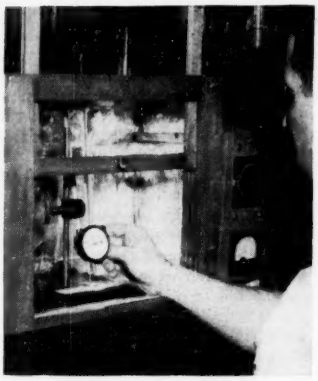
From these rings . . . **. . . samples go in cabinet . . .** **. . . then test begins**



FIRST, liquified coating is poured in ASTM ring to solidify.



NEXT, hardened sample is hooked up with dial-indicator.



THEN, technician begins to measure softening-point of fat.

Now—A Precise Gage of Enrobing Fats

Practical data—that check closely—are now supplied by dial-indicator method of measuring softening point of summer coatings and hard butters

HAROLD CROOKS and WILLIAM F. CARRIERO
Respectively with Crest Laboratories and with Cocoline Products, Inc., Long Island City, N. Y.

A new method that accurately determines the softening point of enrobing fats—vegetable hard butter coatings that are now being used more and more as summer coatings by the confectionery and biscuit industries—has recently been developed in the laboratory of Cocoline Products, Inc., Long Island City, N. Y.

This procedure employs a very sensitive dial-indicator, supplied by Federal Products Corp. And in a special cabinet, bulbs are connected to a Varitran transformer to insure precise rises in temperature.

The enrobing fats generally consist of partially hydrogenated coconut oil or coconut oil stearines, blended in some cases with other hydrogenated vegetable oils. They have a short plastic range, and are quite firm at relatively high temperatures. These coatings should, however, readily liquefy in the mouth, and they should be free of any waxy characteristics.

With respect to physical properties, these fats—as with natural fats and oils—do not exhibit sharp melting-points. And so, with summer coatings for the confectionery and biscuit trades, there is often recourse to melting, softening, and slipping-point evaluation.

Because of the differing compositions of hard butters and hard butter coatings, the conventional tests yield results which often fail to check closely—especially in the hands of different operators. What's more, some laboratories test the comparative stability of samples merely by subjecting them to constant relatively high temperatures, while others hold them in a cabinet under controlled temperatures and simply test their firmness with a glass rod.

It is obvious, therefore, that an accurate method of determining the exact temperature at which softening occurs has been very much needed.

After preliminary experiments, we devised a technic which met all our requirements and gave close checks when used by different operators.

The apparatus (see photos and diagram of assembly) consists of a temperature-controlled foil-lined wooden cabinet with a sliding glass door. Dimensions of the cabinet are 16x14x8 in. Heat is furnished by two 25w., 120 v. bulbs, connected to a Varitran transformer. A dial indicator is mounted on a short metal rod, supported by a ring-stand base. A thermometer is inserted through an opening in the top of the cabinet, and it is secured by a rubber stopper.

Now to the test steps: Liquefy and carefully temper the sample. Mold it in a ring such as that used in the ASTM method for determining the softening-point of bituminous materials. Keep the sample overnight in a refrigerator at 40 to 50 deg. F. The next day put the sample in the test cabinet, and place a ⅞-in. dia. and 1/16-in. thick metal disk weighing 4.6485g. on top of it. Set the indicator reading at 0.003 in. on the negative side. Then bring the disk in touch with the contact-point of the dial indicator. And adjust the indicator to read zero by tightening the dial-indicator adjustment clamp when sufficient pressure is exerted on the disk and sample.

With the thermometer bulb adjacent to the sample and the latter equidistant from the light bulbs, the current is turned on and the sample subjected to heat at a temperature rise of 1 deg. C. every 20 min. As the temperature rises and the sample swells, the indicator will gradually swing to the positive side of the dial. After maximum swelling, the softening-point is taken by reading the thermometer when the indicator then moves toward the negative side of the dial. Examination at this point will reveal a very slight softening when the sample is pressed between the thumb and finger.

Some hard butters and hard butter coatings will show an immediate drifting of the indicator to the negative side. However, on further heating, there will be swelling and the indicator will swing to the positive side. Then it will drop to the negative side when the softening-point has been reached. Other hard butters and hard butter coatings, however, will show a continual dropping of the indicator. In such cases, the softening-point is judged by touching the sample with a glass rod.

Sweat-points may also be determined at the same time. For this test, a magnifying glass is essential, since the true sweat-point cannot be observed with the naked eye. A lens with a 5X magnification is used, together with a source of light focused on the sample—only momentarily—to facilitate observation of the sweat-point.

Samples tested for softening point by the new method have, to date, shown an average swelling of 0.001 in. Many samples sweat before the softening-point is reached, while others sweat after they reach it. Most lecithinated hard butter coatings of known composition showed sweating and softening at the same temperature.

Dial-Indicator Tests Show How Softening Points Vary

TABLE I—VEGETABLE HARD BUTTERS Made by Different Manufacturers Have Varying Softening Points

	Softening-Point Deg. F	Sweat-Point Deg. F
Manufacturer A		
Sample 1	80.9	87.8
2	86.0	88.5
3	82.7	89.6
4	89.6	88.1
5	91.0	89.6
Manufacturer B		
Sample 1	93.2	89.6
2	89.6	91.4
3	92.8	88.2
4	94.2	92.2
5	90.5	86.1
Manufacturer C		
Sample 1	86.0	87.4
2	81.7	86.8
3	85.4	89.2
4	82.2	88.2
5	84.8	88.4

TABLE II—SUMMER COATING Softening Points Also Differ

Sample	Softening-Point Deg. F	Sweat-Point Deg. F
1	89.2	91.4
2	93.2	92.1
3	86.0	93.2
4*	84.5	84.5
5	93.2	89.6
6*	86.3	86.3
7	84.2	85.8
8	86.1	86.2
9	93.2	82.4
10*	81.8	81.8

* Coatings with soybean lecithin.

Note: Samples evaluated for comparative softening-points were treated identically with respect to temperature at which they were held overnight. While samples showed same softening-point whether held overnight at 60 deg. or at temperatures below 60 deg. F., in some cases it was found that samples held at 60 deg. F. failed to swell. It was therefore necessary to determine softening-points by testing firmness of sample with a glass rod. Further work is being done on the method with samples of vegetable hard butters and vegetable hard butter coatings of known composition.

2 Edible Oils Seen Licking Problems

Find less flavor reversion in sunflower seed oil. New corn oil said to prevent oxidative rancidity

ANSWERS to two big problems of edible oil users—flavor reversion and oxidative rancidity—are reported to have been found, respectively in sunflower seed oil and a new stabilized refined corn oil.

In a paper presented at the 118th national meeting of the American Chemical Society in Chicago during September, Ingmar Sollin and Dr. Carl O. Clagett stated that oil from the sunflower seed is less subject to flavor reversion than other edible oils, and therefore should find increased employment in foods. Uses suggested are in oleomargarines, lard substitutes, salad dressings, French-frying and oil packing of foods.

Contains Linoleic Acid

Describing results of laboratory studies conducted at North Dakota Agricultural College, the researchers stated that the oil content of the Advance and Sunrise varieties of sunflower seed is about 30 percent of the total weight. Of this oil content, 75 percent is linoleic acid, a major constituent of edible oils.

Research on sunflower seed oil was part of a quest for new sources precipitated by the postwar shortage of edible oils.

New Stabilized Corn Oil

Development of a stabilized refined corn oil seen more than doubling the shelf life of potato chips was recently announced by A. E. Staley Mfg. Co., Decatur, Ill. It is called an answer for potato chip manufacturers who have long been plagued by spoilage of goods from oxidative rancidity, especially during the warm summer months.

While the new oil was developed primarily for the potato chip industry, it may also have a beneficial effect in all fried foods where oxidative rancidity is a problem.

Tests conducted in company laboratories and by potato chip processors disclosed that chips fried in the new stabilized oil are acceptable for as long as four and five weeks after frying.

The new oil is stabilized with an anti-oxidant that retains its effectiveness even under extreme heat. It was stated that previously developed anti-oxidants would protect oil up to the time it was used, but were neutralized by high temperatures.

Experimental work on the refined corn oil continued over a period of six months. Final tests were made under actual production conditions in plants of chip processors.

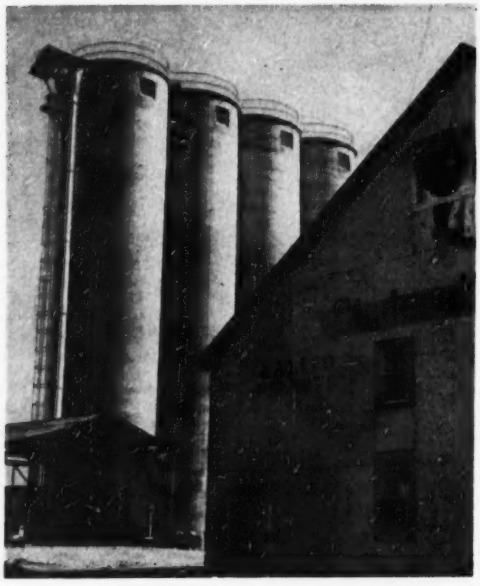
Comes at Right Time

Development of a stabilized corn oil to prolong potato chip shelf life could not come at a better time. With the huge potato surplus on hand, subject to farm support buying, any increased chip making will reduce the outlay of taxpayers' money for the subsidy program.

U. S. Department of Agriculture reports that about 8 percent of the nation's food potatoes will be converted to chips this year. It may be called a net increase in consumption, because the spuds would not have been eaten if they were not made into chips.

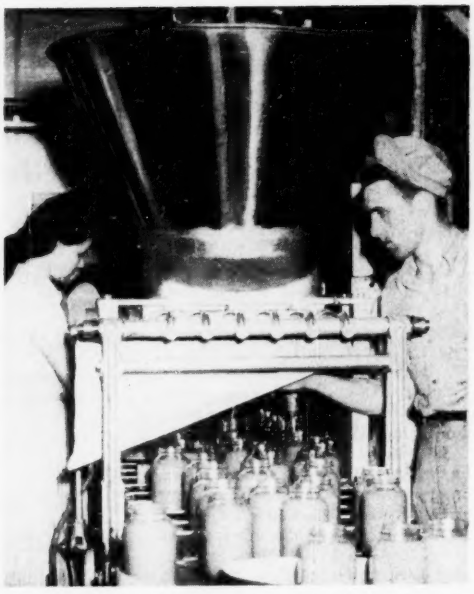
In 1936, when USDA began collecting figures on the industry, 3,000,000 bu. of potatoes were used for chips. Production rose rapidly to 13,000,000 bu. in 1945 and to 20,000,000 bu. in 1950.

WEIGHTS ALWAYS KNOWN: From silos . . .



IN EACH of these silos, quantity of shelled nuts stored for processing is continually checked by recorders.

. . . to jars



GOING into jars, peanut butter is accurately scaled. Subsequent case weights give further checkup.

Scales Point Quick Finger at Losses

Continuous leak-spotting system tells peanut butter maker "how much in, how much out" at every step. . . . Other improvements up quality and cut costs

IVAN C. MILLER
Editorial Consultant, "Food Industries"

THROUGH the installation of automatic weighing units and the adoption of a running, in-process inventory, Cinderella Foods of Dawson, Ga., can detect and measure any loss of product in its manufacture of peanut butter. Accordingly, this operator has been able to achieve top input-output performance.

Operating in a modern structure built in 1943, the company has consistently engineered changes to make its process as nearly continuous as possible, to maintain maximum control of quality, and to remove potential errors of labor, as well as to reduce labor costs.

Outstanding among the improvements is the running inventory system. Through its use, the company not only knows immediately of any product loss, but also knows where it occurred and just how much was involved at the various stations in the process. In short, the system puts the finger on the exact spots where improvements should be made.

The steps of the process will now be briefed, particularly to bring out details of the special materials check-back system.

Net Weight Determined

Shelled nuts are delivered to the peanut butter plant in tractor-drawn carts carrying approximately 15,000 lb. loads. Filled carts are first weighed, then the nuts are dumped into a bucket-elevator receiving hopper, and the empty cart is weighed to determine the tare. The elevator hoists the weighed nuts and discharges them on a belt conveyor running over the top of a battery of four silos. The conveyor delivers the cart load to one of the silos. Total capacity of the silos is 2,000,000 lb.

In this manner, the contents of each silo is recorded. One silo at a time is drawn on to supply the plant needs until it is empty. Nuts are discharged to a belt conveyor beneath the silos and carried to a bucket elevator feeding a storage hopper in the processing plant.

Batch Scale Gives Check

This draw-off of nuts going into process is via a batch scale, and the weight recorded. Thus, as each silo is emptied the recording of the batch scale indicates any losses due to shrinkage, or other causes, at this point on the line.

The measured amounts supplied by the batch scale provide the roasters with an exact charge. Between the scale

Don't Miss Foldout Flowsheet

For a revealing overall-inside picture of Cinderella's topnotch peanut butter operation — with closeup photos and clear-cut diagrams—turn to this month's big 4-square layout just opposite page 104.

and the roasters is a vibrating screen separator. This screen serves as a check on the shelling plant. Any losses due to foreign materials are determined.

Roasters are individual units, but are operated in a battery so that the flow of products is continuous. Above each of the eight roasters is a bin equipped with a level control so that each roaster always receives a uniform charge. When the valve is opened to feed the nuts from a bin to a roaster, the feed to the bin is automatically closed. Uniformity of roasting is assured by having the variables, time and temperature, controlled by instruments.

The original method for cooling the peanuts after roasting has been replaced by a system engineered by the company. Now, roasters discharge into bins with sloping false bottoms made of perforated metal. Cool air is drawn down through the nuts by a suction blower. Subsequently, the nuts are discharged through a valve in the center of the false bottom into a screw conveyor running the length of the cooling bins. Cooled nuts are then elevated to the roasted peanut storage bin above the processing floor.

Roasted nuts are drawn as needed to the blanchers for removal of the skins, and are then distributed to hoppers supplying the mills. Skins from the blanchers are collected, bagged, and weighed. This provides a check on the net weight of nuts from the roasters.

Electric vibrating screens are employed to add the salt in uniform, accurate proportions.

Solve Oil-Handling Problem

Butter from the mills is pumped to a surge hopper above the homogenizer. As the butter feeds into these units, hydrogenated oil is proportioned into the line. Handling this oil, which has a melting point of 140 deg. F., presented problems—again solved by the company's own engineers. The oil melting and holding tanks, and all piping from tank to proportioning pump and from pump to homogenizer intake, are jacketed and electrically heated to a controlled temperature.

The oil must be maintained fluid without any overheating, which would cause discoloration and deterioration. A flowmeter checks on the accuracy of the proportioning pump. Weight of the oil and salt added is calculated in the totaling, since these ingredients are added in measured amounts.

From the homogenizer, peanut butter goes to automatic filling and vacuum-closing machines and then on to casing. Final weight of the product in shipping cases provides a check on losses in processing and also losses due to breakage.

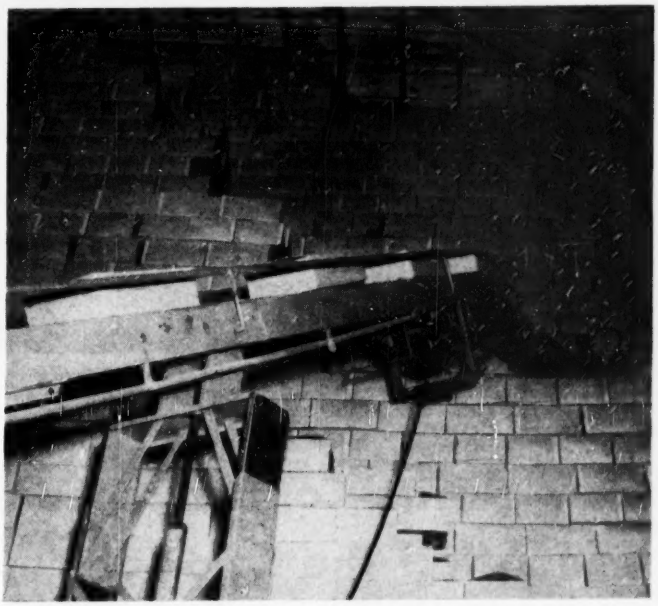
This was the first peanut butter plant to use silos for the storage of peanuts, and the operation has established the advantages of storing peanuts in this manner. Insecticide sprays are installed in the tops of each silo. Heavier than air insecticide gas is sprayed on top of the nuts regularly and penetrates to the bottom. Insect infestation has been completely controlled.

Almost the entire plant output, which has been as much as 24,000,000 lb. per year, is transported to market in company owned trailer trucks. Since the shelf life of peanut butter is limited, use of the company trucks has the advantage of minimizing the time between plant and buyer.

"A Very Real Economy"

The overland trips of these tractor-trailer trucks from the plant in South Georgia include runs to Chicago, the Eastern Seaboard, and places between. Return loads include empty containers and supplies for the plant. There has not always been a return load for every trip, but there have been enough to produce a very real economy in the almost exclusive use of company truck-trailer distribution.

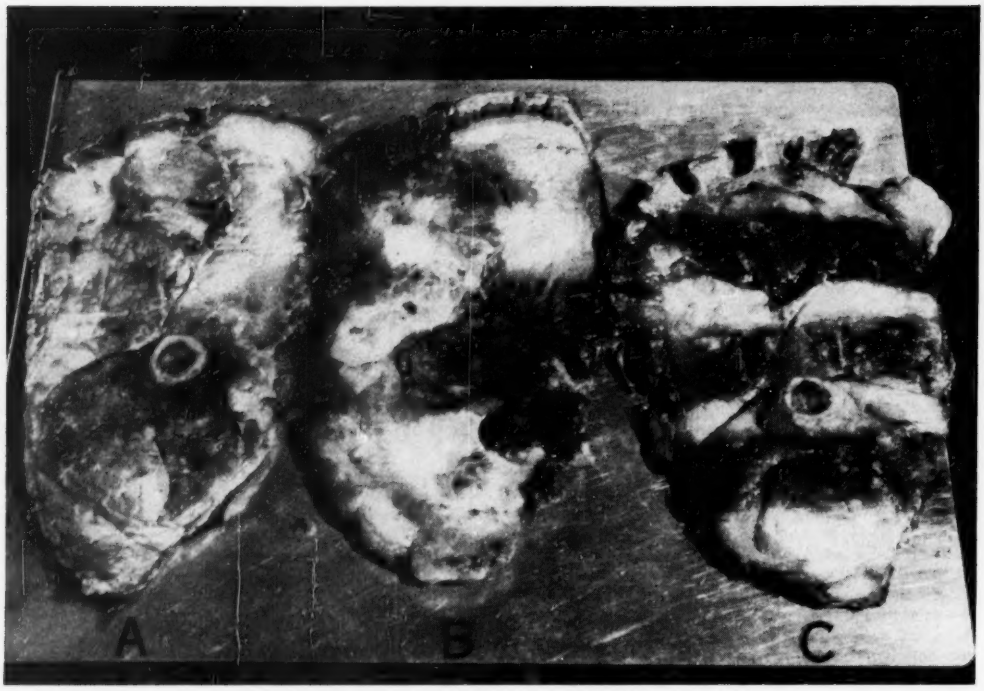
STORAGE AND SHIPPING: Stacker plays lead role



MAXIMUM use of space is gained by stacking filled cases of finished product roof high. Labor is minimized by portable stacker.

TRAILER TRUCKS, company owned, speed product to Chicago and Eastern Seaboard markets. Handling is again by portable stacker (extreme right).

Results With Cooked Ham Slices . . .



SAMPLES of ham broiled after 6 months' storage. Slice A was untreated control, Slice B has been wrapped with three strips of 20 percent sodium nitrite-treated paper, and around Slice C had gone saturated nitrite-treated strips. Slices B and C had come from storage with greenish discolorations. Note pronounced color fixation in Slice C after broiling.

How Nitrite-Contaminated Wrappings Can Affect the Color of Your Meat

Red and green discolorations are reproduced when Cornell researchers test various cuts with treated papers. And fixations are augmented in continued storage

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Undesirable color fixation in frozen fresh meats may be a result of nitrite contamination in packaging materials.

This conclusion has been reached following a special investigation conducted at Cornell University.

To begin with, the colors of foods have been a natural factor in their acceptance. Thus it is that the consumer likes his fresh meat to have the color traditionally associated with the cut—a bright cherry red in beef, light pink in lamb, grayish pink in pork, and light pinkish brown in veal.

When cooked, these fresh meats are expected to become brown. If beef, lamb, or veal retain some of their uncooked color characteristics, there is usually no particular objection. However, if this should occur with pork, the association of insufficiently cooked pork with the disease trichinosis leads to definite discrimination. Cured meats are naturally expected to retain their uncooked pink color.

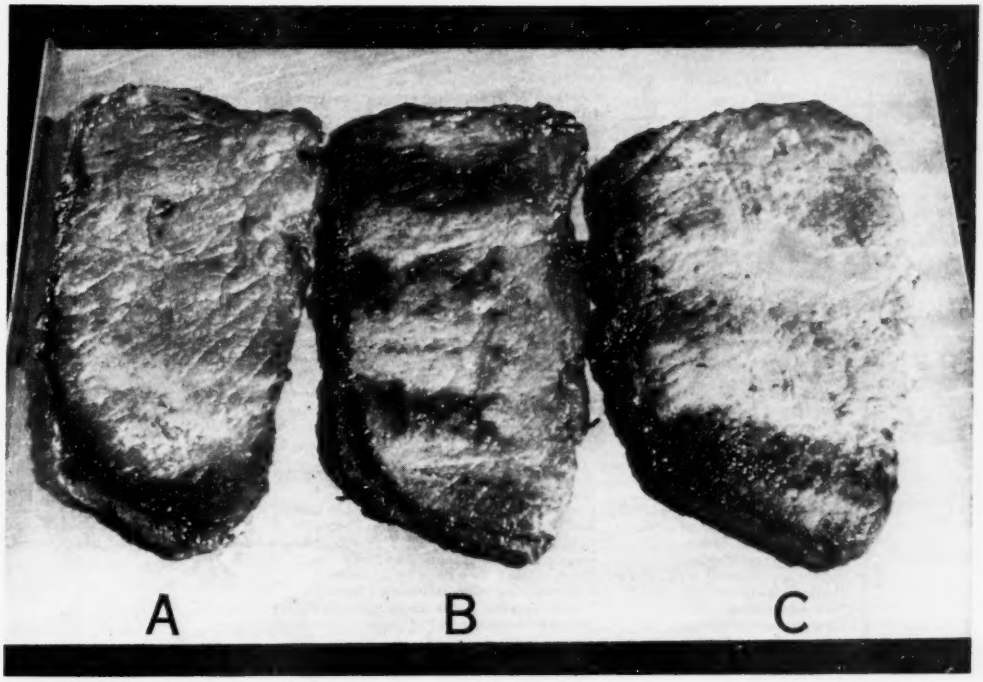
It has been noted that both frozen and unfrozen fresh meat occasionally does not turn color on cooking. Surface reddening has been observed more frequently than internal reddening.

A number of theories have been advanced to explain this condition, the more commonly stated ones being: The presence of nitrites in the water used to wash the carcasses; the cooking of meat with nitrite-containing vegetables; and the presence of small amounts of nitrite in packaging materials (particularly in frozen meats).

Study Launched

In an attempt to investigate the theory that packaging materials containing nitrites fix color in frozen fresh meat so that upon cooking red-

. . . And With Cooked Beef Roundsteak



TEST CUTS of beef roundsteak broiled after same storage period. Cut A was untreated control, Cut B had the 20 percent nitrite-treated paper wrappings, and Cut C had the saturated strips. Horizontal striping had been noted on Cuts B and C as they came from storage. It will be seen that color fixations are marked in these same cooked pieces.

ness is retained, the authors initiated a series of experiments.

Samples of pork loin roasts, slices of fresh ham, slices of beef round, and beef top chuck roasts were used. Three types of 1-in.-wide filter paper strips were used in the test. One set of strips was untreated, to serve as a control. The second set was immersed in a 20 percent sodium nitrite solution and then dried. And the third set was immersed in a saturated solution of sodium nitrite and dried. Three strips of similarly treated filter paper were placed on the surface of each cut of meat, approximately 2 in. apart. The meat was then wrapped in moisture-vapor-proof paper, and immediately frozen at -8 deg. F. All of the samples were stored at 0 deg. F.

From Storage to Cooking

At the end of 1, 3, and 6 months, representative samples of each treatment were removed from the freezer for cooking studies which were conducted by the New York State College of Home Economics at Cornell University. Although color fixation after cooking was the primary consideration, other characteristics were also noted at this time. All samples were partially thawed overnight in a household refrigerator.

What Check-Ups Show

The control samples, which were wrapped with the untreated filter paper strips, retained their normal fresh and cooked color throughout the experiment. The samples wrapped with the 20 percent sodium nitrite treated filter paper strips showed color fixation (redness) immediately adjacent to the paper and to variable degrees between the strips of paper. This redness was apparent both before and after cooking. There was a progressive increase in the area of redness as the storage period increased. Immediately under the paper the meat both in the fresh and the cooked state was slightly green. The degree and area of green discoloration also increased with storage time.

Redness was slightly more evident in the beef cuts than in the pork cuts. After 1 month's storage, color fixation of the treated roasts had penetrated approximately 1 in. from the surface. After 6 months' storage, color was fixed throughout the roasts. In the treated steaks, after 1 month's storage, color fixation was evident only adjacent to the filter paper strips. After 6 months' storage color was also fixed between the strips of the nitrited filter paper.

The samples wrapped with the saturated nitrite-treated filter paper strips showed more extensive areas of red color fixation than those wrapped with the 20 percent nitrite strips. The meat immediately adjacent to the paper was dull dark green, which condition also prevailed subsequent to cooking. All of these samples gave off a strong, disagreeable odor during cooking. The cooked surfaces below the strips of filter paper, in addition to being green, were quite brittle. The areas between the paper were red. All of these samples gave evidence of greater discoloration as freezer-storage time increased.

This study indicated that at the high levels of sodium nitrite used, there was definite color fixation during freezer storage, and that as the length of time the meat was stored was increased, there was a parallel increase in degree and also in the area of color fixation in the meats.

Spot Hazards Quickly With This Basic Checklist

	Does Inspection Here ↓	Show These Trouble-Inviting Conditions? ↓
Plant Proper	Foundation	Cracked or crumbling cement, rotten wood, leaks?
	Roof supports	Improper size, deterioration?
	Floors and walks	Cracked, splintered, slippery? Badly drained, not level?
	Working areas	Loose boards or materials, badly worn?
	Steps	Broken, splintered, worn, uneven?
	Hand rails	Loose, too high or low, obstructed? Supplied where needed?
	Windows	Broken, cracked, dirty, not working?
	Ventilation	Closed work areas, inadequate exhaust system?
	Plumbing and sewers	Improperly constructed, inadequate, poorly guarded? Inaccessible shut-off valves?
	Exits	Unmarked, obstructed?
	Headroom	Inadequate for personnel or equipment?
Electrical	Codes	Improper material, equipment?
	Placement	Loose wire? Near water?
	Connections	Open? Damp? Boxes not waterproof?
	Switches	Unmarked as to control? Not waterproof?
	Extension cords	Incorrect size? Touching damp floors?
	Emergency wiring	In use beyond 48 hr.? Not marked for safety?
	Fluorescent tubes	Not firmly in place? Careless disposal of old tubes?
Equipment	Drive belts, chains	Worn, cracked, dirty, greasy? Poorly adjusted?
	Ropes and pulleys	Improper size, capacity, condition?
	Ladders	Cracked or broken rungs? Rotten wood?
	Pipes and valves	Leaks, cracks? Inaccessible shut-off?
	Tools and machines	Cracked or broken parts? Not being used for specified job? Not stored?
	Operating methods	Improper speed, load, position?
	Safety equipment	Inadequate? Not used by operator?
	Moving equipment	Interference with pedestrian travel?
	New equipment	Faulty moving parts, improper wiring?
	Fire extinguishers	Not tested regularly?
Operational	Tool storage	Not adequate, poorly located, not used?
	Stock storage	Leaning stacks, fire hazards, unplanned arrangements?
	Maintenance Materials	In poor condition? Inadequate? Improperly stored?
	Waste	Fire hazards, unsanitary conditions? Obstruction to passageways? Frequent safe disposal?
	Lighting	Burned out, dirty or inadequate bulbs?
	Processing areas	Not clean? Obstructed?
	Personnel	Not safety conscious? Won't use safety devices? Hours too long between breaks? Machine speeds excessive? No routine physical check-ups?

WHEN an "accident maker" is found, it should be corrected right away—and kept corrected through periodic checkup.

Cut Your Output in This Department

—Meaning the accident department! . . . This practical article outlines an anti-mishap plan that can't miss, and that brings striking benefits

FI STAFF

Quite logically, enterprising managements are usually striving for a "more"—more output, more savings, more efficiency. But that striving can fail unless there are also efforts to achieve a very important "less"—less accidents.

The fact is that the right safety program, properly implemented, can do more than merely support your plant improvement plan. It can set the pace in bringing higher production rates, in stabilizing operating costs, and in establishing better employee relations.

A carefully developed safety campaign has brought all those benefits at Birds Eye-Snider Division of General Foods Corp. And the performance of that organization's program is particularly significant:

■ **In one group of plants, lost-time accidents were cut from 50 to 16 in the very first year—and then to but 4 in the first half of the second year. All this despite a better than 25 percent increase in plant production.**

■ **Specifically, that first year saw the accident frequency rate reduced nearly 75 percent (from 26.91 to only 6.77).**

■ **Moreover, the sum of $60,000 was saved on compensation premiums paid by the Division during a one year period.**

One breakdown indicated that 78 percent of plant accidents could be attributed to unsafe acts of workers, 20 percent to unsafe conditions, and 2 percent to "acts of God." The best

method known to prevent 98 percent of such mishaps is the well planned and carefully followed safety campaign.

How you can develop such a program for your own plant is outlined in the following brief, which draws in great part upon the procedures so effectively employed at Birds Eye-Snider.

Prime Angles

Accident prevention must be attacked from two prime angles—first, safety consciousness should be developed in all branches of the personnel, in order to minimize unsafe acts; second, there should be prompt correction of all hazardous conditions.

When you analyze the safety conditions in your plant there are several points to be remembered. If you already have a safety plan, has it actually reduced the number of accidents? Was it arranged with *your* plant and problems in mind? How long since it was revised? How *alive* is it?

If your program is in the developmental stage, a careful study of your accident records for the past year will give clues as to where attention should be directed. What type of accidents have been most frequent? Does the fault lie primarily with the workers? Or is it a case of the workers being hampered by lack of safety devices?

Initial goal, then, is to determine the best approach to getting *your* plant on the credit side of the safety record. Drafting the program and implementing it follow.

5-Step Plan to Safety

Study of a successful safety program will show that any plan must include the following steps:

I. "Selling" everyone concerned on the benefits and the need for action—management, supervision and workers.

II. Investigation of existing conditions, with the full cooperation of all employees. In short, determination of where safety is needed.

III. Study of accident control as applied to your specific needs.

IV. Getting active cooperation of supervisors in planning and enforcing safety measures.

V. Developing safety consciousness throughout the plant—from top management all the way down.

Now to consider these steps in more detail.

I. "Selling" the Benefits. From the company viewpoint safety, carefully practiced, offers the following incentives:

1. Lowered cost of operation by minimizing lost-time, employee replacement, damage to equipment and product, compensation charges.

2. Higher production through improved health and morale of workers.

From the standpoint of the supervisory staff increased safety means:

1. Better production because of more stability of the trained working force.

2. More cooperation from the workers.

3. Less time lost training new workers as replacements.

Basic, in the final analysis, is "selling" the worker. Programs have proved that he will become an enthusiastic promoter of safety when he realizes the personal advantages. Reasonable assurance of health and freedom from the threat of crippling injury with accompanying pain, loss of income, and impairment of future earning capacity—these benefits are immediately evident. When the worker also realizes the improvement shown in his work and, consequently, his income, his interest will definitely be aroused. And when he or one of his fellow workers has contributed a worthwhile suggestion and seen it put in practice, he will be thoroughly won over.

II. Investigating Conditions. There is no spot in your plant that should be overlooked when you start out to develop or improve your safety program.

Shown at the start of this article is a handy check list that can be put to immediate use. As a guide, it will enable you to spot the particular areas in your establishment most in need of attention. Each processing plant has its own trouble spots, and someone working there should be familiar with each one.

This is where the full cooperation of every employee can be of very great value. The supervisor can't (as he will tell you) be everywhere all the time. When the worker, too, is watching for trouble, it can often be spotted before an accident takes place.

"Carelessness Isn't It"

As for accidents where the cause lies with the worker, Hoke Simpson, Division Personnel Manager for Birds Eye-Snider, says:

"We avoid the use of the word 'carelessness'. For carelessness isn't it. In reality, a worker fails to practice safety for one of these three reasons:

"He *doesn't know how* to do the job safely.

"He *can't do* the job safely.

"He *doesn't care* about doing the job safely.

"Find which classification the particular worker fits, and it will then become apparent what corrective action to take."

III. Studying Accident Control. Briefly, the application of accident control calls for a sound knowledge of existing conditions and a determination to remedy matters.

Detailed accident reports show what has happened. Knowing what conditions, machines and workers were involved, careful study can find the cause and from this the cure.

First-aid records are combined with imagination to show where minor mishaps under other circumstances might have been major accidents. Again, finding the cause can point to the cure.

Checklist surveys will reveal conditions needing change—will spot them before an accident happens. Details of housekeeping and materials handling (likely taken for granted because they were customary) are often revealed as hazards when attention is drawn to them during the course of a general survey. Comparison of current checklist disclosures with those of six months

Would This Happen In *Your* Plant?

A repairman, busy on a steam boiler maintenance job at a western food company, was reaching down to loosen a union—when his long-handled wrench accidently hit the fuel-line valve. There was a gush of oil. Flame flashed out of the open door of the boiler and ignited his clothes. He writhed in agony.

Another worker rushed to aid him, then fell back and desperately began looking for a pail of water. But remembering that "water's no good on an oil fire," he changed his mind, ran for the fire extinguisher on the wall nearby—and then again changed his mind, fearing that whatever chemical it contained might not be safe on a man. At this point, he hurried off to turn in a fire alarm.

By now, the cries had attracted another employee. This man ran up and tried to put out the flames with his hands. The attempt proved futile. He then searched about—at last found a piece of canvas. He wrapped this around the injured man and finally smothered the fire.

The repairman later died as a result of this accident. A life was lost because of the failure to know what to do in an emergency—the difference between getting the canvas first and getting it last.

Do your workers know what to do when an accident occurs?

previous will show up any neglect to remedy conditions.

At times, the best method of approach calls for the services of a trained safety man. However, much excellent reading matter is available for study and National Safety Council recommendations are applicable always.

Remember, however, that ready-made, prepackaged safety campaigns cannot get the best results unless they have been altered to fit *your* conditions.

IV. Getting Supervisors to Help. Supervisors are the key men in a safety program. It is they who must take most of the responsibility for bringing each safety hazard to attention, developing the remedy, and enforcing the correction. They must try to:

1. Set a good example. They should believe in safety and the elimination of hazards. By eliminating hazards, they convince the workers that the company and supervision believe in safety.

2. Follow a system of "selling" safety suggestions to workers who don't seem cooperative. Safety can be achieved by analyzing the job, determining the best and safest way to do it, and checking the worker's habit pattern. Then the worker must be persuaded to follow the procedure decided upon.

3. Check habitual accident victims. There is always a reason why a person is "accident-prone." Does the worker know the safe method of doing his particular job? Is he physically fitted to the work? Does his trouble come from some psychological disturbance? These are the people who can spoil the record of the most safety-conscious department, not only through their own mishaps but because of the effect they have on their co-workers.

4. Make themselves available at all times for safety suggestions from any worker. Suggestion box ideas should always be followed up. Even when the worker's suggestion isn't new, it still means that something needs looking into. The man who made the suggestion will be more ready to make a second one if he knows the first received attention.

5. Keep full records of all accidents. This includes minor mishaps as well as major ones requiring hospitalization or doctor visits. Small incidents, too, are responsible for lost-time and production slowdown. And the small accident carefully analyzed may point out a condition that could result in major trouble.

6. Learn how to make full use of all available safety material—literature, posters, contests, awards—and in every way encourage safety consciousness among foremen and workers.

V. Developing Safety Consciousness. In building safety consciousness—without which no safety campaign can succeed—plantwide publicity for the initial campaign is essential. Persistent followup and booster campaigns must be adopted if the benefits are to be made lasting. Each new employee must be instructed in the safety standards of the company and their application to his job. Suggestion boxes, contests, and awards all help keep the worker's interest alive. Instructive literature, lectures and movies, and foremen's discussion groups keep the supervisory group interested and aware of new developments.

Returns Surpass Outlay

When first considered, a complete safety program seems to entail considerable cost. But hundreds of firms are today promoting all-year-'round safety programs not only to better the workers' situation but as a part of company cost-cutting plans.

As for safety devices, saving workers from physical injury is not their sole function. They also guard costly machinery against overloading, improper use, and damage during the course of an accident.

A good housekeeping campaign brings to the attention of the maintenance department conditions that should be corrected, and by doing the repair job early there is precluded the need for major rehabilitation.

Above all, safety can prove a most effective weapon against labor difficulties. Frequent turnover of help, excessive absenteeism, poor foreman-worker relationships, and lack of company spirit can all be found in a plant where safety is left to chance.

A program that works to establish a safety-minded personnel working in a plant maintained in a hazard-free condition is well worth the effort and outlay involved.

SAFETY IN ITSELF ISN'T ENOUGH

To maintain and multiply safety after you get it takes that most essential ingredient—publicity. Without continuous fresh publicity, interest cannot be kept alive—the carefully thought out rules are forgotten, the worker loses his awareness of safety.

Good publicity is not difficult to achieve. Placed in the hands of a responsible person or group of people, it can readily be made a vital part of plant procedure. Aids in carrying out plantwide publicity are:

Individual Safety Awards—

To be given to workers whose suggestions and ideas have been proven valuable. Suitable awards include safety button for the lapel, credit for producing the idea, special privileges, cash awards.

Bulletin boards showing—

Candid shots taken during working hours showing safe and unsafe acts. These pictures of scenes and people well known to the workers are watched with keen interest.

Company overall record showing—

Number of days worked without a lost-time accident.

Number of man-hours worked without a lost-time accident.

Total of man-hours in last record period of safety.

Department record in working area—

Patterned on company record display but showing department data.

Safety display posters—

Either the commercially prepared posters or ones created for plant.

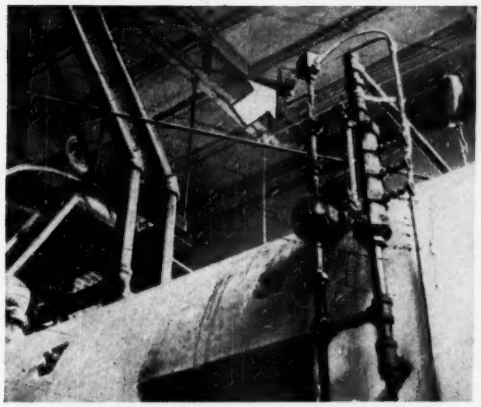
Enlisting the ability of a talented employee is desirable here.

Special safety record flags—

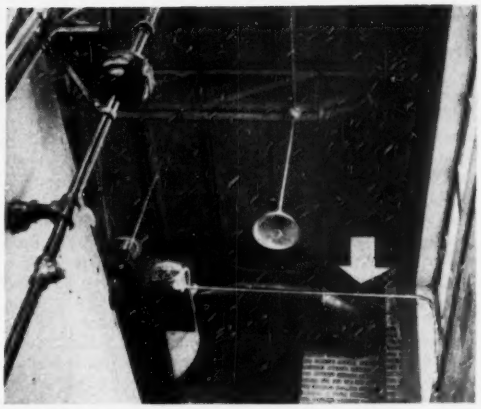
To be displayed in the department having the best company standing.

Here the competitive spirit can be used as an able ally.

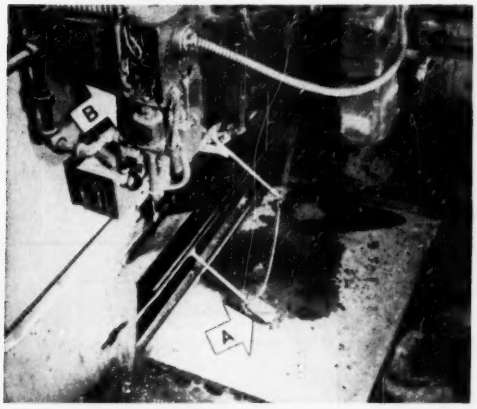
Four Ways to Improve Your Operation



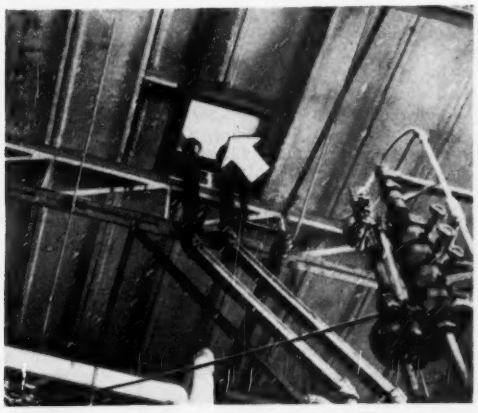
ON EACH SIDE of boiler mount three controls—two pressure-limit and one low-water level unit.



USE STACK SWITCH. Installed in flue back of blower, it is heat-sensitive, ups rate of fuel and air.



DURING IDLING, use counterweight (A) to keep damper open. It's closed (when running) via motor controls (B).



MAKE roof ventilator a permanent opening. Have pressure relief valves discharge into pipes exhausting to vent.

Save Boiler Dollars by Going Automatic

Engineer tells how company got notable economies—new safety, too—by simple adoption of controls for the draft blower, burners, and boiler-water levels

W. A. REED

Plant Engineer, Taylor Reed Co.
Glenbrook, Conn.

Through the investment of a few hundred dollars in control equipment, we have effected an annual saving of several thousand dollars in the cost of operating our 200-hp. boiler—by going automatic.

In food plants having large process-steam requirements, a full-time boiler room attendant is an economic necessity. But in the plant where process-steam requirements are low, a full-time boiler operator may be an expensive luxury.

Our experience in making a small steam generator fully automatic—and safer and more economical to run—may be helpful to others in the industry who operate 200-to-400-hp. boilers that are not yet fully automatic. Here's the story:

At Taylor Reed we employ two fundamental circuits for our boiler room controls. One circuit regulates the induced draft blower, the other controls the oil burner. These controls are interlocked mechanically and electrically.

The induced draft blower is normally started when one of the pressure limit switches reaches a predetermined setting. These switches and one low-water cutoff switch are the only con-

trols in series with the induced draft blower motor starter coil. For maximum safety, two low-water cutoff controls and four pressure limit switches are wired in the control system.

Our steam demand varies. For processing, the automatic control system is set for a pressure range between 95 and 100 psi. For comfort heating, the pressure ranges between 15 and 30 psi.

Current is fed through a low-water cutoff to a double-throw selector switch which determines whether it passes through the high-pressure or low-pressure limit switch to the induction draft blower motor. With this wiring arrangement, the boiler controlled by the low-pressure switch will cycle between 15 and 30 psi. Merely by flipping the double throw selector switch the boiler will function between 95 and 110 psi, the process steam range. The selector switch and the master switch are the only manual controls. This was specifically planned for labor economy. Automatic control of steam pressure at two levels economizes on fuel.

The pressure limit switches are single throw, therefore the fourth contact on the induction draft blower motor starter is not used in the blower circuit. This contact is used in the oil burner motor starter circuit. The damper control motor on the burner is a sequence motor. The burner starts on a low flame.

When the stack switch detects the heat from this low gas flame, the rate of both fuel and air to the burner is increased up to the maximum. And if adjustments have been carefully set, there is no smoke from the stack at either the low rate of fuel and air feed or at the full rate. There is, however, slight stack smoke during the interval when the burner is operating at ¾ full rate.

Special Damper Technic

As the burner motor changes the position of the various levers it operates, it also closes the lower damper. We depart from a generally accepted principle of boiler operation in the way we use the lower damper. It is cracked a few inches during the time the burner is not running and closes as the volume of air to the burner increases when the burner starts running. With the damper cracked while the burner is stopped there is the advantage that the slight draft admitted produces greater accuracy of the stack switch control.

We have a short token stack. Our boiler is new and the combustion chamber free from the leaks that come with age. When the induced draft blower is shut down there is practically no natural draft through the combustion chamber. If the damper is not opened, radiant heat from the hot bricks in the combustion chamber will retain a high temperature in the stack for too long a period after the burner has been cut off. This is particularly true of an efficient installation which maintains stack temperature at approximately 500 deg.

The cracked damper supplies only sufficient draft so that the stack control notes a temperature drop at the right time. Even though the damper is open when the burner starts on low flame, the heat is sufficient to operate the stack switch.

Our stack control is of the domestic type and has functioned satisfactorily for over three years. It is a standard stock switch which incorporates two functions. When the switch has reset on lower temperature, the oil burner control is made ready for a heat call, which will start the induction draft blower motor and, in the proper sequence, the burner motor.

The burner control is a standard type to which the stack switch is attached in the normal way. When the switch detects heat, it operates the relay in the burner control. This relay starts the motor that closes the damper. When the burner motor starts, the control energizes the ignition transformers and the gas solenoid valve. Both the electric ignition and the gas are turned off by the control when the stack switch indicates sufficient temperature rise.

The 110v. current serving our control panel is supplied through either one of the two pressure limit switches, depending on the position of the selector switch. Boiler pressure is controlled primarily by the induced draft blower current, but in case of overtravel the oil burner current is opened. This system has been in operation for three years and has proved efficient.

Four Safety Switches

The following limit switches are connected in series in the oil burner circuit to provide maximum safety:

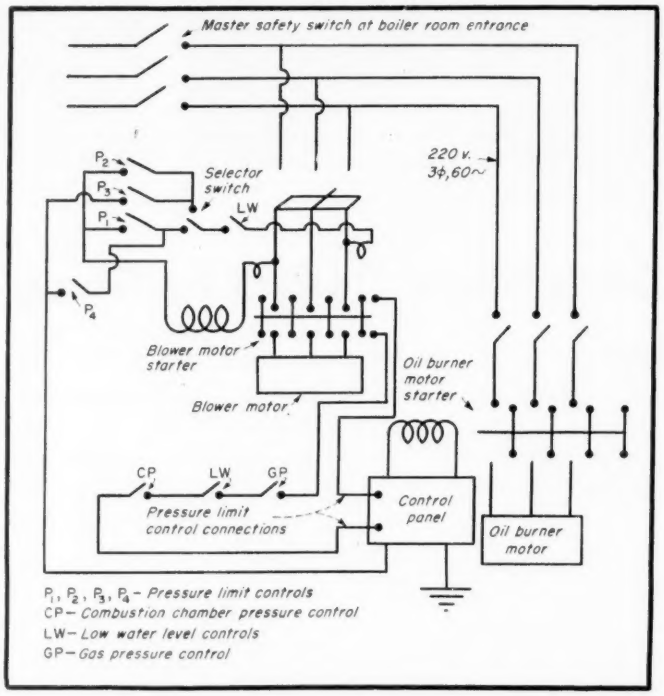
1. Gas Pressure Limit Switch. Should the gas line clog or the city pressure drop to a point causing faulty ignition, the standard oil burner vapor switch, mounted on the gas line, prevents current flow in the pilot circuit.

2. Negative Pressure Switch. This limiting switch insures negative pressure in the combustion chamber before the burner can be started. If the belt on the induction draft blower motor breaks or a sheave slips, stopping the blower, the positive pressure resulting interrupts the burner circuit.

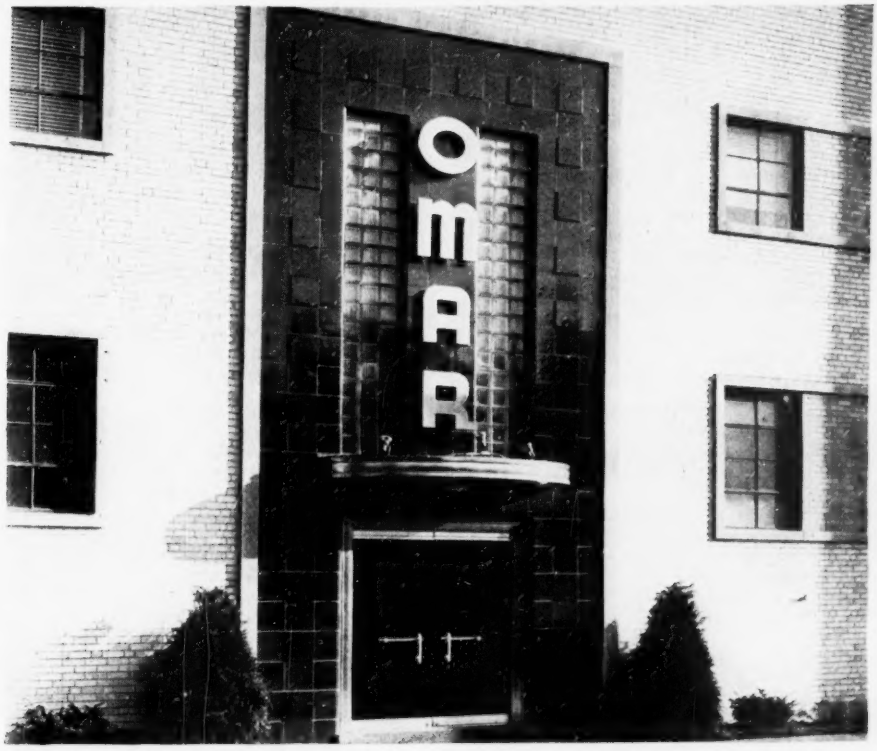
3. Low Water Cut-Off. There are a number of float-type boiler level switches on the market. Those we employ have two low-water cutoffs. As

(*Turn to page* 190)

How Control Wiring Is Hooked Up



A SPECIAL FOOD INDUSTRIES REPORT



THIS Columbus, Ohio, bakery sets pace by turning out 7,200 loaves of bread, 720 dozen doughnuts hourly.

PACE-SETTING PLANT

—introduces advanced processing and management methods that now spark forward trends in bakery field. . . . Notable advances have been made in technics, unit operations, formulation of products, materials handling, sanitation, and quality control. Latest employee and public relations have created goodwill among workers and customers. Better sales coverage has been attained by consumer research, product-selection surveys, and route streamlining

JOHN V. ZIEMBA
Assistant Editor, "Food Industries"

From a small flour-milling business to a $9,000,000 baking corporation in little more than two decades—this has been the outstanding expansion of the enterprising Omar, Inc., of Omaha.

How did this firm grow so big so fast? Well, behind this progress have been two active forces: Advanced processing practices and up-to-the minute management methods.

Prominent among the modern practices that have paid off in steadily increasing output are improved unit operations, technics, product formulation, materials handling,

sanitation, and quality control. Centralized purchasing has also played a big role. With it, duplication of effort is eliminated and inventories are more effectively controlled.

But the success-medal must be pinned on management for putting the company on top and keeping it there. Here's the special, double-headed effort management made:

First, it concentrated on harmonious employer-employee relations. Introduced were an efficient seven-step method of screening applicants for employment, on-the-spot training programs, improved working conditions, a from-the-ranks promotion system and a realistic attitude toward unions. Further, there was purchase of the latest advanced equipment to enable workers to do their jobs easier and better.

Second, to catch the market it had staked out, management evolved a broad expansion program. This built better sales coverage through consumer research, product-selection surveys, and route streamlining. It also required modernizing all the bakeries in order to step up production to meet increased sales.

Important factors making for the company's phenomenal growth are its early adoption of such practices as: (1) Guaranteeing the freshness of its products, (2) extending credit to its customers, and (3) putting up its products in sealed packages.

Columbus Plant Hailed

This company, now operating six bakeries, has doubled its branch distribution system throughout the Midwest in the last three years.

Most modern of the six bakeries is the one located at Columbus, Ohio. This bakery, with District Manager George W. Tassié and his assistant Robert H. Hoffman, at the helm, represents a notable peak in the unique growth of the company. For here are two unusual installations—a huge bread oven and a giant doughnut machine, each probably the world's largest. The oven bakes 7,200 loaves of bread an hour, and the doughnut unit turns out 720 dozen doughnuts an hour.

With straight-line production and the latest equipment and technics, output of baked goods comes about as near being continuous as it is possible for such operations to be.

The bakery at Columbus includes 74,000 sq. ft. of manufacturing space in a steel, brick and concrete building having two stories and a basement. Total space occupied by the plant is 125,000 sq. ft.

Keeping the Bakery Comfortable

"Spot" air conditioning has been installed at this bakery. Blowers force cool air into excessively hot areas where employees are working. Such places may be in front of ovens or cooking kettles. Exhaust fans, on the other hand, pull hot air out of areas where heat is being generated—directly over ovens, or sections where baked goods are being cooled on the floor.

Let us see how this spot air conditioning works around the huge bread oven: Here, conditions are made comfortable four ways: (1) Blowers force cool air from outside the building directly over workers depanning the bread; (2) a large stainless steel baffle, extending across the front of the discharge end of the oven to within about 2 in. from the top of the bread, deflects the oven-heat from the men emptying bread from the pans; (3) a stainless steel hood at the discharge end of the oven diverts some heat to the main exhaust duct; and (4) this large duct, running across the top of the oven, carries hot air to an exhaust fan.

The forklift-truck pallet system of handling raw materials not only facilitates the work but, by double-stacking pallet loads, it enables the company to store twice as much material in its warehouses.

Flour, sugar, shortening, cartons, and wrappers are unloaded from trucks and freight cars and put on pallets. Forklift trucks carry the pallets into warehouses, where they are double-stacked. Then, as needed, all raw material is trucked on pallets from warehouses to production areas in the bakeries.

Production of baked goods at Columbus is handled by five departments—bread, sweet roll, plain roll, cake and pie-doughnut.

Separate Scaling Room

Weighing of most ingredients going into the mixers or cooking kettles is centralized in the commissary or scaling room. Bulk ingredients like flour, however, are directly scaled into mixers. Water is metered into them.

By scaling most of the ingredients in one department, there is better control over inventory, greater accuracy, less congestion in mixing and cooking areas, and improved sanitation.

Production is scheduled by the order department. After the salesmen have submitted their daily requirements, an order clerk figures out the amount of ingredients needed. A scaling report is then issued to the commissary covering the number of standard and fractional batches required for each item to be manufactured and the amount of ingredients per batch. Detailed mixing instructions also appear on the back of each report. Batches prepared in the scaling room consist of pastry dough, cake batters, icings, fillings, doughnut batter, custard and meringues.

Ingredients are weighed into easy-to-stack, bell-bottom aluminum receptacles that are transported to mixing areas.

Preparation of the cake and cookie batters, pie dough, icings, fillings, and custard is carried out in a separate mixing room adjacent to the commissary. Here, there are two 340-qt. and four 80-qt. mixers for making cake batters. Fillings and custards are cooked in three stainless steel, jacketed kettles holding about 200 lb. And a 180-lb. capacity kneader makes up the pie dough.

The bread department operates 18 to 20 hr. a day. Of the bread manufactured, 85 percent is white and the remaining 15 percent is variety—rye, Vienna, French, raisin, whole wheat, and cracked wheat.

Production starts at 4 A. M. with the variety breads. Then, at about 10:30 A. M., the manufacture of white bread is begun and completed at about midnight.

Special Flour Handling System

And now for a step-by-step account of the bakery's bread-making operations:

Flour is trucked from a nearby warehouse on pallets, each holding 21 sacks. Initial step is to prepare the flour before it is mixed with other ingredients. A special closed flour-handling system, designed by company engineers from units in Omar's former mills, automatically blends, stores, sifts, and scales the flour. Prior to scaling the flour goes through an Entoleter. To confine flour dust, the dumping operation is carried out in a separate room, away from the production areas.

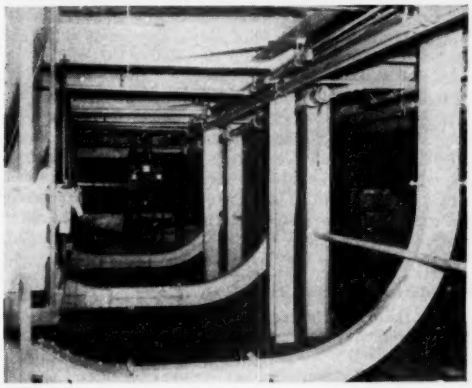
Different lots of flour are mixed according to any desired ratio by making dial adjustments that vary the star wheels on the two blending machines. Twin-worm screws carry the blended flour to a main worm-screw that delivers it to a self-cleaning elevator with stainless steel flights. Lifted three stories, the flour next drops into another horizontal worm-screw that feeds five 40,000-lb. metal storage bins.

Again, five self-cleaning elevators carry the flour, as needed, from the bottom of the bins to a spacious, well-lighted mixing room on the second floor.

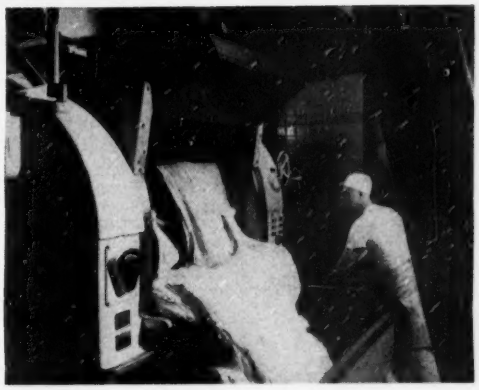
To further assure freedom from infestation, the flour is screened through an all-metal gyrating sifter and then passes through an Entoleter at the rate of 15,000 lb. an hour.

Next, the flour is lifted by bucket conveyor from the Entoleter to another horizontal worm screw that feeds

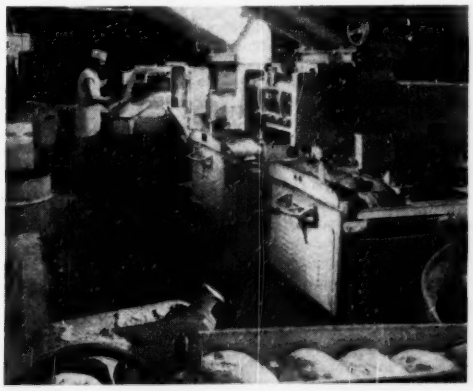
Modernized Bakery Is Specially Geared for Volume Output



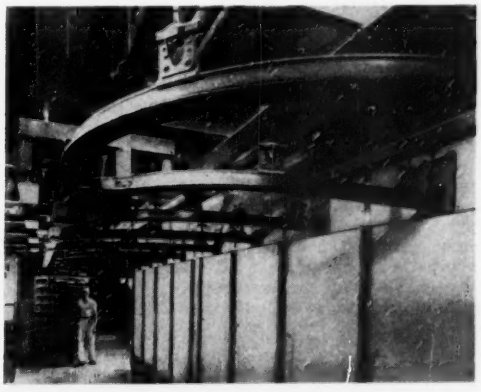
SANITARY flour-handling system features these closed, curved, self-cleaning elevators delivering 15,000 lb. hourly of blended flour from bins (left) to gyrating sifters.



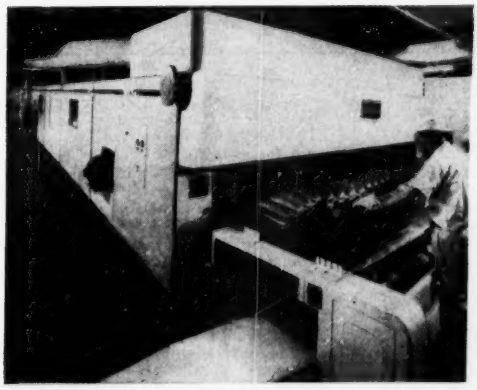
MIXER is equipped with flour-scale and dough-trough hoist. Omar has five mixers. One prepares sponge; two mix dough; two more are for variety breads and sweet dough.



TWO DIVIDERS (right) automatically cut six loaf-size pieces of dough at a time, and flour-dust them before they go to rounders, where they emerge as balls.



RACKS of panned dough (background) are pushed via overhead rail through final proofer, on to oven. Racks return to molders. Panned dough remains in 100-deg. F. proofer.



OUTSTANDING in bread bakery is this special 135-ft. grid-hearth oven. It bakes 7,200 loaves an hour. Oven employs diathermatic (indirect) system of heating.

HUGE, glass-enclosed cooler holds 11,000 loaves. Drawn from outside, air goes through filters and a series of cold city-water sprays, and circulates through unit.

scale hoppers holding 1,000 lb. Flour is now automatically weighed by these electrically controlled scales and emptied into high-speed mixers.

Filling of the flour-storage bins is simplified by means of a level-indicating system. All the bins are wired to an interlocked circuit so that only one bin can be opened for filling while the conveying system is operating. An 8-in. dia. rubber diaphragm, set flush in the inside wall of each bin, is deflated when the bin is full. This movement actuates a limit switch, acting as a safety device to cut off another switch that stops the conveyors. At the same time, a red light flashes on a panel at the flour-dumping station, indicating that the bin is full. The operator then opens another storage bin and starts feeding flour into it.

Mixing is done in five machines. One prepares 1,300 lb. of sponge. Two machines mix 1,600 lb. of dough each. Another makes 1,600 lb. of dough for variety breads. And still another unit handles 1,000 lb. of sweet dough.

Making the Sponge

After flour and the yeast-vitamin-malt mixture go into the sponge mixer, water is metered in. Since temperature of the city water varies from 36 to 68 deg. F., it must first be regulated to 50 deg. F. This is done by adjusting dials that feed either refrigerated (36 deg. F.) or hot (180 deg. F.) water into the city-water line.

Adding the yeast-vitamin-malt mixture to the sponge mixer is another job that has been made easy. The ingredients named are blended in a special unit—large enough for a batch of sponge—and pumped into the mixer. Then, the required amount of water for each batch of sponge is pumped through the yeast blender into the mixer, flushing the unit and pipes at the same time.

Ingredients to make the sponge are mixed for about 3½ min. Then, the sponge is dumped into greased, metal troughs, which are rolled into the fermenting room.

Greasing of the dough troughs is still another of the many jobs that has been simplified. Formerly, these troughs were greased by hand. But now an automatic greaser, operating under 40 to 50 psi. distributes less grease more uniformally.

Improvements In the Fermenter

Workers no longer have to open and close the doors as they push troughs in and out of the fermenters. Instead, four sets of electric eyes, set in the floor inside and outside of the fermenting room, open the two doors as the troughs pass over them.

Another advantage of these "eyes" is the prevention of bumping of the doors by the troughs.

The fermenting room holds 50 troughs of sponge or dough and 20 troughs of sweet dough. Temperature of this room is kept at 80 deg. F. and the relative humidity at 77 percent. Both temperature and humidity are automatically controlled. When the humidity drops, a series of atomizers spray water into the room until the relative humidity again reaches 77 percent. There are concrete curbs at the base of the walls to keep the troughs from bumping into them.

After 4½ hr., the sponge is taken out of the fermenting room. Next, a hoist lifts the trough above a dough mixer, and the sponge is dumped into it. Sugar, salt, shortening, and milk solids—weighed in the scaling room—are then added. Flour is scaled and 38-deg. F. water is metered into the mixer. Ingredients are then mixed for 15 min. And finally, the dough is dumped into a greased trough that is again pushed into the fermenting room.

Dough Chuted to Divider

Here, the dough rests about 30 min. Now ready for the make-up operations, it is dumped into two stainless steel hoppers set in the floor of the fermenting room and chuted to two 6-pocket dough dividers on the first floor. This is another job that has been simplified. Chuting dough to the dividers does away with trough hoists.

The hoppers are specially constructed so that dough dumped into them opens two spring-operated stainless steel plates feeding the chute. After dough goes through the plates, they automatically close. This way, cold air and mold spores from the floor below are kept out of the fermenting room.

The entire make-up operation—cutting dough into uniform pieces, then rounding, proofing, molding, and placing them into greased pans—is entirely automatic.

The dividers cut the dough into six small pieces at a time. Next, the small pieces of dough are dusted with flour as they go to two rounders, where they emerge as a ball. Leaving the rounders, the balls of dough are automatically spaced and deposited on canvas belts that travel back and forth through two overhead, enclosed, preliminary proofers. Here, the dough rises—doubles in volume—in 13 min.

From the proofers, balls of dough are chuted to two molders, where they are shaped into "loaves" at the rate of 7,200 an hour. The loaves are then automatically deposited into greased pans. Straps of pans, containing four loaves to a strap, are loaded onto racks. And the racks are pushed via overhead monorail from the molders through the final proofer, on to the bread oven. The empty racks go back to the molders, completing a continuous circuit.

The Columbus bakery reports that one man can push ten racks with one hand on the monorail—a handling operation that has substantially increased production and greatly reduced upkeep.

Story of Progress

Omar, Inc., was started in 1917 by W. J. Coad, president for 32 years and now chairman of the board of directors. He initially organized the company at Omaha to operate a flour mill. This mill was enlarged several times, and a second one was built in 1936 at Denver.

In 1925, the company branched off in another field—baking. Reason: Mr. Coad had been observing the steady inroads made on the family flour business by commercial bakers. Thus, he foresaw the trend away from home-baking.

Still retaining its flour business, the company acquired four bakeries in rapid succession. Bakeries were purchased in 1925 at Columbus, Ohio, and at Indianapolis. Then, in 1926 and 1927, new bakeries were constructed in Milwaukee and Omaha. The fifth bakery, at Hamilton, Ohio, was purchased in 1943.

First Omar distribution branch was opened in the early '30's at Lancaster, Ohio. And, as company sales rose through this period, the potential value of the home-bakery service began to unfold. In 1947, the management launched long-range expansion plans for bakery production and sales. Immediately, a new distribution branch was opened at Des Moines, Iowa. Soon after, Omar began new branches across the Midwest, at the rate of one every two months.

After the first phase of the expansion program was completed in 1949, the system was more than doubled—12 additional branches were opened and 20 new buildings were erected to replace leased ones. Moreover, a $1,500,000-addition was made to the Columbus bakery.

Prompted by its outstanding success and the dwindling sale of family flour, the company sold its mill properties in 1949. And now, greater attention goes to house-to-house service.

In December, 1949, Mr. Coad became chairman of the board. Chosen to succeed him as president was his son, W. J. Coad, Jr., who had 20 years of experience to fit him for this top role.

Start of the company at Omaha was small. But the foundation was solid, helping to explain why the company has become a $9,000,000-baking corporation—the second largest of its kind in number of routes, employing 3,119 workers and serving over 500,000 customers.

Racks of panned dough remain in the proof box at 100 deg. F. for 70 min. Temperature of the box is automatically controlled.

Oven Bakes 7,200 Loaves Per Hour

Most outstanding unit in the bread-baking department is the 135-ft. long and 15-ft. wide traveling oven—probably the largest of its kind. This oven weighs 216,900 lb. It is made of steel with baked enamel finish and has stainless steel parts. It bakes 120 1¼-lb. and 182 1-lb. loaves of bread a minute—enough to meet the daily demand of 150,000 regular customers.

The new oven features a special grid hearth that assures a more uniformly baked loaf of bread because of better heat distribution. Important, too, is the more efficient diathermatic (indirect) system of heating.

The oven is gas-fired from four burners. And circulating fans carry the hot combustion gases through a series of 3-in. pipes located above and below the grids conveying the bread through the oven. Temperature of the oven is automatically controlled in four sections so that it never varies more than 5 deg.

Bread is baked at 480 to 500 deg. F. for 26 min. Leaving the oven, bread is manually dumped from the pans. Empty pans are conveyed to the greasing station, and bread is carried to a 160-ft. cooler—also probably the largest of its kind. Refrigeration is supplied to the cooler by drawing air from outside the building through filters and a series of cold city-water sprays. The cold, purified air is then circulated through the bread cooler.

This huge unit holds 11,000 loaves of bread. And it takes the bread 90 min. to cool as it travels back and forth two times through the unit.

Wrapping Is Highly Efficient

Slicing and wrapping are the final steps to the bread-making operation. Bread is chuted from the cooler onto a merry-go-'round conveyor that feeds five automatic slicing and wrapping machines, each capable of handling about 50 loaves a minute. Only three slicing and wrapping machines operate at the same time. The other two are ready to go without loss of time just as soon as a roll of paper is used up on one of the three machines in operation.

To curtail "cripples"—improperly wrapped bread—the rolls of waxed paper are stored in a nearby 15-ft. x 15-ft. stainless steel, walk-in type refrigerated room. By cooling the paper in this manner, softening of the wax during warm weather is prevented, together with subsequent difficulties that are encountered in unwinding the roll of paper during the wrapping operation.

The wrapped loaves are packed into fiberboard shipping boxes—24 loaves to a box—and the boxes are loaded onto route trucks or semi-trailers.

The other large unit at the Columbus bakery—the automatic doughnut machine—forms, proofs, fries, glazes, and cools 720 dozen yeast-raised doughnuts an hour.

Sugared doughnuts are also made in this unit. These bypass the glazing station and continue through the cooling section before they go to the automatic sugaring machine. This machine consists of a rotary tumbling screen and drum that applies the sugar as the doughnuts travel through.

Making 500 Pies An Hour

Pies are produced in this manner: Dough is made up in the kneader and trucked to the make-up room. Here, the dough is sealed into 72-oz. pieces that are fed to a pie-dough cutter. This unit divides the dough into 19 small, equal-size pieces which are then loaded on trays and held overnight in a refrigerator.

Next day, the dough is ready for rolling. Each small piece of dough is fed to a pie-sheeter. Equipped with two

Doughnut Machine Is Another "No. 1"

GIANT UNIT produces 8,640 yeast-raised doughnuts per hour. It automatically forms eight doughnuts at a time, then proofs, fries, glazes, and cools them.

steel rolls, this machine reduces the dough to a thickness of ⅛ in. A canvas-belt conveyor carrier the sheet of dough to an operator who places it in a pie tin. Farther along the line filling is added.

Now the pie is ready for the top crust. Another piece of dough is run through a second pie sheeter and placed on top of the filling to complete the pie.

Dough hanging over the edge of the tins is cut off manually and the edge of the dough is crimped. To prevent the edges of the crust from scorching during baking, wet crepe paper bands are wrapped around the edge of the pies.

Finally, the pies are baked in rotary ovens, racked, cooled by circulating air, packed in boxes, and sent to the shipping department. Production is 500 8-in. pies an hour.

10,000 Cup Cakes An Hour

Now for the cake-making operation: enough batter is prepared to produce 2,340 layer and more than 10,000 cup cakes an hour. The batter is trucked in the mixing bowl to the make-up room, where a hoist lifts the bowl to the hopper of the cake depositer. Batter is then deposited into greased pans for layer cakes (39 a min.) for cup cakes (180 a min.).

Pans are now loaded on racks that are pushed to the ovens. There are three ovens—one tray and two rotary. After the cakes are baked, they are loaded on racks and allowed to cool 40 min.

Cakes are now ready for the finishing operation. First, they are removed from the pans onto a canvas-belt conveyor. Next, filling is spread on top of the bottom layer. The top is then put over the filling. Cakes are then loaded into racks and allowed to "rest" for 10 min. in order to prevent the layers from sliding.

Finally, the cakes are put on another canvas-belt conveyor, where icing is applied with a spatula. The cakes are then either packed in boxes and sent to shipping or they are put in cardboard trays and machine-wrapped with heat-sealable cellophane.

Volume Output On Sweet Goods Line

Making the sweet goods proceeds in this way: Dough is prepared in a 1,000-lb. capacity mixer, dumped into a trough that is rolled into the fermenting room, and allowed to rise for 45 min.

Conveyors Speed Sweet Goods

BELT carries dough through two sets of rolls that form it into a continuous sheet. Then filling is added and dough is folded over.

CONTINUING on belt, dough is cut into rolls by rotary unit. Behind cutter, men shape and place rolls in greased pans that are then racked.

AFTER proofing and baking, sweet rolls are fed by another conveyor to machine (above) that spreads icing on them. Rolls are then packaged.

Proofing follows. Dough is scaled—to 8-lb pieces in the case of cinnamon rolls—and loaded into wooden trays that are placed in proof boxes for ½ to 1 hr. This step makes the dough lighter and prevents crusting.

The dough-break operation follows proofing. Here, the dough is prepared for make-up by expelling gas from the dough as it is sheeted to uniform size and shape.

Spreading the filling or sprinkling the sugar-spice mixture is next. Sheeted dough is placed on a canvas-belt conveyor that carries it through two sets of rolls. These rolls further reduce the thickness of the sheets and form the overlapped dough strips into a continuous sheet.

Fillings are now added. If a dry filling—like the sugar-cinnamon mixture for cinnamon rolls—is used, it is sifted on the dough by a machine. If, on the other hand, a wet type filling is being employed, it is spread by hand over the top of the dough with a spatula.

Now the dough is prepared for cutting. Strips of dough are folded by hand to get two layers of filling and three layers of dough. Or, as in the case of cinnamon rolls, the dough is curled. This is done by means of a special unit that consists of a corrugated aluminum roll. The roll is rotated by means of an electric motor, and it extends diagonally across the edge of the belt. As the roll turns, it curls the strip to form a cylinder of filled dough.

Folded or curled strips are straightened to the proper length and thickness in order to get the correct number and size of pieces. As the strip continues along the belt, a rotary cutter forms the rolls—414 cinnamon or 336 pecan rolls a minute.

From the cutter, the pieces of dough are twisted, knotted, or formed into any shape before they are placed in greased pans and loaded on racks. The racks are then rolled into a proofbox. After sweet rolls have been proofed for an hour, they are fed into a traveling tray oven.

After baking, the rolls are cooled, machine-frosted, packed in trays, and the trays are finally machine-wrapped with heat-sealable cellophane. A special machine, operating under 40 to 60 psi., deposits frosting on top of the rolls and coffee cakes. Rubber fingers on this unit uniformly spread the frosting over the products.

In making the plain buns, mixing of the sponge, fermenting it, and then preparing the dough is done the same way as bread. After the dough is mixed, it is fed to a vacuum scaler. This unit, operating under about 17 in. of vacuum, scales 220 uniform pieces of dough a minute, the vacuum pulling the dough into the pockets. As the dough leaves the hopper of this machine, it drops into twelve adjustable rotary cups that form the pieces. Cups can be easily adjusted to scale dough in sizes ranging from ½ to 5 oz.

From the scaler, the dough is conveyed to a rounder that forms the small pieces of dough into a ball. Next, the balls of dough drop on a turntable, where they are placed in greased pans—6 to 8 rolls to the pan. Then the pans are loaded on racks that hold 102 to 136 pans. Racks then go to the proof box. Final steps are baking and then packing the rolls in trays that are machine-wrapped with heat-sealable cellophane.

One novel installation on the plain roll line is the company-designed slicer for frankfurter and hamburger rolls. This high-speed slicing machine handles 20-dozen buns a minute, and the speed of the unit can be increased to 30-dozen rolls a minute. The machine consists of a 4-in. wide canvas-belt conveyor that feeds the rolls between guides to a rotary disk knife, operating at 3,500 rpm.

Organized Sanitation

Keeping the bakery clean is a full time job of the sanitation department. Heading this department is a foreman with a total day and night crew of 28 men. Specific du-

These Units Step Up Production of Plain Rolls

FROM vacuum scaler, dough goes to rounder and panning turntable.

HIGH-SPEED slicing machine handles 20-dozen frankfurter or hamburger rolls per minute. Sliced rolls are then trayed, cellophane-wrapped.

ties of the Columbus bakery's sanitation department are:

1. To mop and vacuum-clean floors, walls, and ceilings, also wash windows.
2. To clean equipment after the day's work.
3. To safeguard product quality by eliminating insect and rodent harborage areas.
4. To inspect raw materials on hand in order to curb infestation that may have taken place before the ingredients reached the bakery.
5. To conduct weekly sanitary inspections and issue reports to management.
6. To dispose refuse in areas away from the bakery.

Efficient Selling and Distributing Mean Better Area Coverage

Backbone of Omar's bakery business is the route salesman: And to strengthen the firm's competitive position, methods had to be devised to enable maximum sales at minimum distribution costs.

The answer was efficient training courses for new salesmen and more effective methods of distributing and of covering routes.

New route salesmen are now extensively trained to assume their many job responsibilities. First, they get a two-weeks' training course, in well-designed, comfortable classrooms. Purpose of this course is to teach general policies of the company, its history and progress to date, plans for expansion, rules and regulations, selling methods, credit procedures, keeping sales records, safe and efficient driving technics, and human relations.

Well-heeled with the basic knowledge of selling, they next get a practical training course. These junior salesmen are assigned to a branch location, where they get 6- to 12-weeks' training in actual house-to-house selling. At this stage, they are trained by supervisors or route salesmen and paid on a weekly basis.

Finally, these junior salesmen are given routes as they open up. Openings turn up because of promotions, transfers, job turnovers, and expansion into new territories. The men now become full-fledged salesmen and they begin to work on commission.

Overall planning and policy making of the selling operation stem from the general sales department in Omaha. The sales department at each of the five bakeries is headed by a sales manager. Under him are two assistant sales managers. At the Columbus bakery, for example, the sales manager has charge of ten branch distributing centers. And each of the two assistant sales managers under him is responsible for five branches.

Omar long ago learned importance of details in house-to-house selling. Thus, these details have been thoroughly investigated and reduced to simple standard operations. Result: Benefit to the salesman, his customer, and the company.

Makes Up to 300 Daily Calls

Each salesman calls on 200 to 300 houses a day, serving more than twice that number of customers. While nine-tenths of a salesman's working time is without supervision, each man follows a definite pattern. He must efficiently utilize his time. And he has been taught how much time to spend with each customer—it averages 43 sec. In addition, he has been instructed on the best way to pack his basket for maximum efficiency and to handle credit to the satisfaction of customers and company alike.

Of the 1,200 house-to-house routes covered by Omar this number of routes represents an increase of 230 over last year. And as production goes up, new routes are constantly being added in carefully surveyed territories.

It takes 3,150 employees to cover the 1,200 routes. And the Columbus bakery employs 955 of them on 351 routes.

The company serves one out of two homes in its distributing area. And the overall average for city and farm areas is one in three.

Examination of the routes from 1940 through the 1949 fiscal year, ending in July, disclosed that the annual average sales for each route increased from $20,221 to $27,617. Number of routes during this decade more than doubled—from 425 to 918. And total route sales almost trebled—from $8,590,000 in 1940 to $25,010,000 in 1949.

Omar is reported to be one of the first in the baking industry to extend credit to its customers. Those using the credit plan pay for the merchandise at scheduled inter-

vals—every week or two. Saving of time for both customer and salesman is the benefit derived from this plan. Losses attributed to this system are extremely low—amounting to only one-fourth of a percent.

The freshness policy was started in 1933. Now, all unsold goods are removed from route trucks each night and then sold in company surplus stores.

Convenient house-to-house service was a practical answer to the increasing demand for fresh baked goods. This development paralleled advances in truck transportation. And home delivery service was the logical move following the trend to the branch method of distribution.

Both factors—better means of transportation and the establishment of branches in outlying cities as focal points—have enabled Omar to out-Bunyan the fabulous Paul. Route after route has been opened. No longer are there the restrictions of the horse-and-wagon days.

One of the first to recognize the possibilities of operating under this system was Omar. Its first branches were opened in the early '30's. And today plans call for further expansion and perfection of its branch system of distribution.

In addition to reaching more customers at a lower shipping cost, this system enables the bakeries to increase their production. And by raising output, unit production costs are reduced.

Farthest branch from the Columbus bakery is 95 mi., or two hours away. Branches out of this bakery are serviced by 18 trailer loads of baked goods on peak days. One trailer supplies enough merchandise for 15 or 20 routes.

Trailers leave every evening, except Saturday, from the Columbus plant on their runs to branches in Marion, Zanesville, Chillicothe, Lima, Lancaster, Newark, Mansfield, and North Columbus.

Beautiful Construction an Asset

All new branch buildings have been constructed for a life of 50 yr., and they have the same general design, to permit uniform operating efficiency. They are located in the outskirts of cities to keep route trucks out of congested areas and yet near route centers.

These one-story structures are made of concrete and steel-brick, and they have insulated roofs. Widths are the same (110 ft.) but the lengths vary from 68 to 168 ft., depending upon the truck-storage requirements.

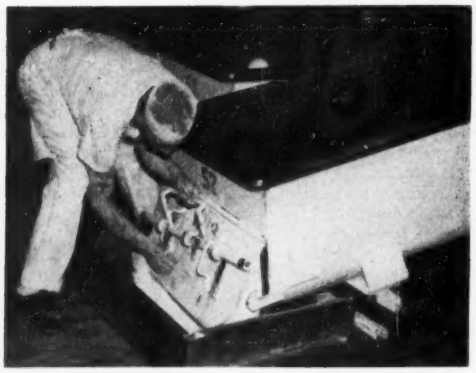
Each unit consists of a shipping area, repair garage, office, training room, sales check-in room, and sufficient off-the-street parking space to accommodate employees' cars.

The office area includes branch manager's office, return-goods room, meeting room, two washrooms, utility room, and check-in room.

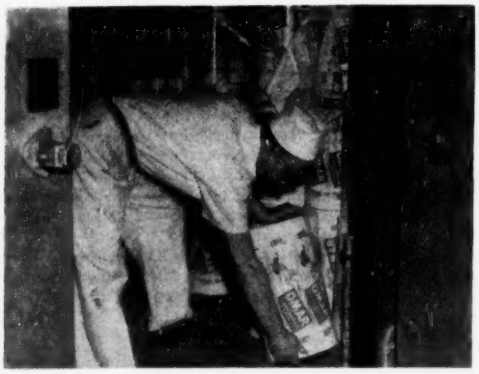
Production-Speeding Devices Simplify Workers' Jobs

ADDING yeast and enrichment material to mixers has been made easy with this blender from which mix is pumped.

SPRAY-GREASING of dough troughs saves bakery considerable time and labor over former hand-greasing technic.

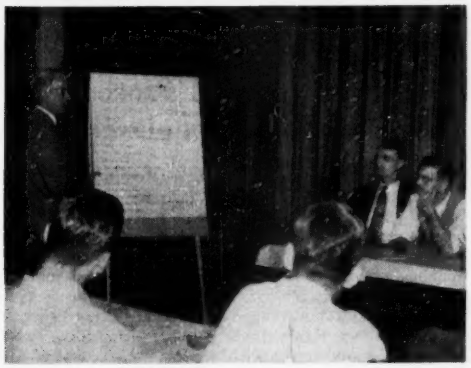


STAINLESS STEEL CHUTE, set in floor of fermenter, delivers dough to divider on floor below.



BY "CONDITIONING" waxed paper rolls in walk-in cooler, bakery prevents "cripples" during bread-wrapping.

Salesmen Are Backbone of Omar's Bakery Business



NEW route salesmen get extensive two-weeks' training course before they assume their many job responsibilities.

SUPERVISOR checks out salesman in booth, "peps" him after new customers. Note safe-driving display (right).

Floors in the office are asphalt tile. Partitions are painted concrete block. Ceilings have suspended acoustic tile. And fluorescent lighting is used.

The check-in room has been specially designed to save the time of salesmen. It consists of check-out booths, tables with counting machines, and a cashier's cage. Supervisors can check out two route salesmen at a time in a booth. There is one supervisor for every ten salesmen. Counters enable the salesmen to tally their orders rapidly and make them out for the next day.

The new buildings are attractively landscaped. And they are a valuable asset to the company and community.

Output at the branches has been doubled by scheduling production more closely with shipping. The old method required too many handlings. Bread, for example, was loaded into boxes, stacked on the floor in the shipping department, and loaded onto route trucks or trailers. Now, boxed bread goes directly into 32-ft. trailers, each hauling 600 boxes with a capacity of 12,000 loaves, or roughly 7½ tons.

Arriving at the branch, trailers are unloaded and the goods are sorted and put into route trucks. Schedules for production, distribution to branches, and loading of route trucks are precisely timed so that there are no delays—for any disruption in the even flow of products from plant to customer costs time, money, and freshness.

Keeping the company's 1,400 trucks and cars in A-1 condition requires competent mechanics and first-class garage equipment. Omar has both.

Trucks cover 16,000,000 mi. yearly. To keep them moving requires 1,800,000 gal. of gasoline, 9,000 tires, and 25,000 gal. of lubricating oil annually.

Each trailer carries three colors. Top is aluminum. And sides are white on top and red on the bottom. The lettering, "Omar Bakeries," appears on the sides; "Omar" in front; and "Omar Bread" on the rear. In all cases, this lettering is done with plasticized luminous decals.

In sunlight, the decals look like any fine, painted signs. At night, lettering in the rear is illuminated by the headlights of approaching cars. The word, "Omar," in the front is illuminated by a floodlight mounted on the top of the cab.

Thus, day and night, passing and approaching motorists are visually reminded of the company's round-the-clock efforts to bring fresh bakery products to their doors.

Because these decals can be "picked up" sooner by the headlights of approaching cars, motorists see them quicker and at a greater distance than signs made of ordinary paint. Reason: Light striking the decals is reflected instead of absorbed. It's good advertising, and there's an added factor of safety.

Drivers Kept on Their Toes

Expanding business during the past two years has almost doubled the size of the fleet. And it has also doubled chances of accidents.

So keeping the drivers out of accidents called for a stepped up safety program. Omar then began to stress safe, defensive driving.

The defense-driving part of the program is an instructive one. Drivers are told to be alert for the reckless and careless ones and to use foresight in avoiding dangerous situations. Good eyesight, quick reflexes, and ship-shape mechanical equipment mean nothing if they are not used to avoid potential dangers on the roads.

Awards are given to create interest among drivers and to direct public attention to the fact that the company's salesmen have outstanding records as safe drivers. All who regularly operate trucks are eligible for the awards. They may be route salesmen, sales supervisors, store delivery drivers, or operators of trailers.

Safe drivers receive emblems for pasting on their trucks. Emblems show the driver's name and number of years of the award.

Safe driving buttons and rings are also given out. Each of these bears a crest inscribed with the number of years the driver has gone without a chargeable accident. Buttons are awarded for the first through the fourth years; rings after the fourth year.

A plaque goes each month to the branch with the best group-driving record. Branch plaques are presented by the district managers. And when he wishes, the manager may make the award for some phase of a truck operation that needs emphasis.

An individual driving-performance chart is posted in each salesroom. Colored stars are placed on the chart each month to show at a glance whether a driver had an accident-free month, non-chargeable accident, or a chargeable one.

Route Streamlining

To get better sales coverage, two independent surveys—one considering distribution, the other a gage of the consumer and his wants—are carried out by sales research forces in each district.

Distribution surveys determine potential customers in

Distribution Is Streamlined

OMAR TRAILER loaded with freshly baked goods, plies through the night, headed for distributing branch. Farthest is 95 miles from Columbus.

ROUTE TRUCKS are immediately loaded after trailers reach branches. House-to-house deliveries extend about 40 miles from each branch.

an area, how much they will buy, and where they are located. Routes are laid out so that the number of miles and potential sales are kept in a practical ratio. This calls for an accurate knowledge of where the homes are located and what the potential sales are in each town and rural area. With this information, each route is drawn on a map. Then the route is covered by truck to check the mileage and home count.

The newer consumer research and product selection survey checks the prices the customers will pay and the products they want and will buy.

Carrying out the company's vast expansion program requires considerable planning and preparation before the first loaf of bread is delivered in the new area. Land must be purchased. A branch building must be constructed. Sales territories must be routed. Salesmen must be hired and trained. Trucks must be purchased and serviced. The new building must be equipped. And last, customers must be solicited.

When the big day rolls around, each new salesman—equipped with a truck, route map, and an empty customer book—contacts all potential customers along his route. At this time, all the hours of preparation and training begin to pay dividends. Now comes the important job of providing customers with service and quality products on every trip. Routemen must strive to keep their regular customers and also work to gain new ones.

Improved Personnel Procedures Assure Topflight Employees

Main objective of the personnel department in hiring workers is to choose the "right man for the right job." Without an adequate selection and placement procedure, turnover in employment would remain high and the production of uniform, quality baked goods at record output would be difficult to maintain. For too long, the industry has been taking it for granted that there is an adequate supply of steady-working, competent bakery workers. Today, however, this attitude must be changed.

Hiring competent, skillful workers costs money—and so does losing them. When a highly trained worker leaves it can be figured that the company is set back $200 to $500, depending upon the job. High labor turnover is also costly in morale. It means the plant has dissatisfied workers who are not performing up to par. A high labor turnover also gives a company a bad name.

Recognizing this, Omar has adopted an efficient employment-selection technic that has enabled it to reduce labor turnovers to 2-3 percent per month. In contrast, labor turnovers in the baking industry, as a whole, run 5 to 8 percent per month.

By keeping its workers happy, Omar has earned an enviable record in the communities it serves. Moreover, a greater number of high-caliber personnel—knowing of Omar's harmonious employer-employee relations—now seek employment with the company.

Screening Applicants

Selecting workers is a seven-step job with the personnel department: (1) A preliminary interview, (2) application form, (3) diagnostic pattern guide interviews, (4) work preference checks, (5) physical examination, (6) evaluation by foremen, and (7) rating reports at one- and three-week intervals.

How does the personnel department go about using this employment-selection technic?

First is the preliminary interview—the crux of the entire technic. At this point, the personnel director learns the applicant's basic qualifications and whether he is really interested in the position that is offered. And that's not all. He further sounds out the applicant to determine any "unseen" factors affecting job suitability, and he gages the chances of the company losing the man after "investing" in him.

Perhaps the applicant lives too far from the plant, and hence there's the factor of difficulty in getting to work on time. On the other hand, he might be a war veteran who had suffered a bad leg wound. Naturally, the personnel director would have to judge him a risk in route saleswork, for here quite a bit of leg-work is required. Such a man would be considered for other jobs that do not require much leg-work—perhaps a desk job.

On the basis of the preliminary interview—Step 1—the applicant is rated according to his personal appearance, physical ability, voice, poise, manner of expressing himself, education, self confidence, intelligence, industry, motivation, and interest in Omar job opportunities.

Now—Step 2—he is qualified to fill out an application form. Details in this form pertain to the job seeker's general history, physical condition, education, social background, and war record. He is asked to take the form home, fill it out, and mail it back to the company.

Having passed the preliminary interview and returned the application form, he is ready for Step 3. He is called in for a diagnostic pattern interview. Here, he really gets a good going over. Questions asked at this stage relate to his previous work, social activities, motivation, economic and financial history. And his personality is also evaluated.

Next comes the Step 4—checking the applicant's work references. Forms are submitted to previous employers who are requested to answer questions referring to the type of work done, earnings, length of service, personality, character, ability to do a satisfactory job, and reasons for leaving.

Now for Steps 5 and 6: A thorough physical examination is scheduled. Then the applicant is passed on to the foreman for whom he is to work. The foreman then judges him on his ability to do the job to which he will be assigned. If the foreman turns down the applicant, he must furnish the personnel director with satisfactory reasons. However, few applicants that reach this stage are ever rejected by the foreman, since they have met all of the job specifications already agreed on by the foreman and personnel department.

Up to this point, the personnel department has furnished the foreman with the best worker that could be secured. And after the worker has been employed one week, the foreman fills out the seven-day progress report—Step 7.

The foreman checks the following questions on this report: Are you satified with his personal appearance? Does he get along well with his fellow workers? Does he do his work without being told or reminded? Does he "catch on" to instructions quickly? Does he make a lot of mistakes? Does he report for work on time?

Final step is the 21st-day progress report, which must also be filled out by the foreman. This form has been devised to determine if the worker is qualified to be a permanent member of the company.

The worker is finally rated according to personal appearance, attendance, physical fitness, friendliness, alertness, housekeeping, quality of work, courtesy, personality, accuracy, dependability, and knowledge of the job.

When either the 7th or 21st day reports are unfavorable, the personnel department follows-up to assist with such corrective steps as may be indicated.

The company maintains that no matter how good the working conditions are or how well the plant is equipped, quality products cannot be produced efficiently unless properly qualified personnel have been selected. And the man chosen for the job must also like his work.

Both before and after a worker is hired, details of the position are clearly, concisely, and accurately stated. Thus, the new employee knows his salary, working hours, duties, working conditions, benefits, and opportunities for promotion.

Better Workers—Higher Production

Omar emphasizes the human side of production. And by keeping workers happy and satisfied, its bakeries and branches are staffed with better-than-average employees. What's more, the company's aim is to equal or better the going wage rate.

Assisted by recommendations and the establishment of a method of appraising the progress of employees, district management was able to make 672 promotions during the past year on a fair and impartial basis—an enviable record!

All sales managers, assistant sales managers, branch managers, and sales supervisors, for example, came from the ranks. All are former route salesmen.

Promotions involve four basic standards: (1) Work record with the company, (2) personal record, (3) test scores based on intelligence and aptitude examinations, and (4) merit ratings.

Employment of these standards has eliminated guess work whenever the workers are considered for promotions. Because a salesman does a crackerjack selling job, has seniority, or is well liked does not necessarily qualify him for a position as a sales supervisor. He must have the knowledge and ability to handle this position.

Omar maintains a realistic attitude toward unions. In all its contract negotiations, it feels that the protection of its competitive position is vital to employees and employer. All issues are approached in a factual manner, and all proposals are weighed as to their ultimate effect on the company's competitive ability.

Because of the management's policy of cooperation with the unions, not one grievance has gone out of the Columbus bakery.

Good relations are enjoyed with all unions. Bakery & Confectionery Workers, A.F. of L.; International Brotherhood of Teamsters, Chauffeurs, Warehousemen & Helpers, A.F. of L.; and International Assn. of Machinists have contracts in the company's bakeries.

New employees acquire their skill and training during on-the-spot training courses, working under experienced

Accent on Good Men Saves Company Money

APPLICANT (left) is given stringent interview by Personnel Director C. D. O'Donnell. Special system works to put right man in right job.

MEETING exacting requirements, applicant is accepted. Introduced to foreman (above), he's ready for work. After 7th and 21st day, latter reports his progress.

foremen and co-workers. Foremen, for example, are specialists in one or more phases of bakery production.

To raise the efficiency of the personnel, air conditioning and "spot" air conditioning were installed, wherever possible, in the Columbus bakery for year-'round weather control. The air conditioning system dehumidifies in the summer and adds moisture to the rooms in the winter. In addition, it filters fresh air that it draws from outside.

Omar recognizes the service of veteran employees. Last year, as an example, service awards went to 250 employees who represented a combined service of 2,250 yr. Free, semi-annual health check-ups are given to all personnel in accordance with company policy.

Buying Operations Centralized To Avoid Duplication of Effort

Efficient purchasing is assured through a centralized department set up in Omaha under a vice-president. Responsible to him are specialists engaged in buying raw materials, packaging supplies, trucks, equipment and construction materials, and general supplies (uniforms, stationery and office equipment).

Each of the bakeries has a local purchasing agent who advises the central purchasing department at Omaha of his bakery's raw material requirements and who keeps inventories under control. Gathering information on new products, equipment, and materials is another duty he must perform.

Policy of the purchasing department is to buy top quality raw materials at the lowest prices, for delivery when needed. To attain this objective, buyers must be well versed in the specifications set up for raw materials and their inventory needs. Buyers constantly gather and assimilate market information from every available source so that good raw materials can be bought at lowest prices.

The purchasing department buys $15,000,000 worth of supplies, services, buildings, and equipment in a year. By operating efficiently, this department saves considerable money annually, eliminates duplication of effort, and maintains a tighter, more effective control of inventory.

Duplication of effort is done away with by having one office—the central purchasing department in Omaha—do the buying. Money is saved, too, because the company can buy larger quantities at lower prices.

Back of the inventory-control system is this objective: Keep the inventory low so that there will not be a lot of high-priced items on hand when market prices decline.

To maintain this effective control, the purchasing department has issued instructions to all bakeries on the maximum number of weeks that they can cover themselves on major ingredients, such as flour, sugar, shortening, and the like. Coverage limitation on lard, for example, is four weeks. But this limit can be extended, particularly during shortages or when there are adverse market factors.

In order to handle large inventories efficiently, considerable attention has been devoted to advanced methods of warehousing and handling of raw materials. By employing the latest forklift trucks and pallets, warehouse crews make maximum use of storage space and keep the movement of raw materials toward production areas in clock-like precision.

Tremendous amounts of the major raw materials are purchased annually. For example, a month's supply of flour for the Columbus bakery amounts to 28,000 sacks. And it may be noted that last year Omar baked goods (bread and sweet items) required 27,000,000 eggs and 1,722,500 gal. of fresh milk.

Waste—where it might exist even to a small degree—has been greatly cut down through the establishment of a salvage-control system.

As stated, baked goods remaining on route trucks at the end of the day are sold in surplus stores. Also, materials like cotton bags and shortening drums that cannot be re-used in the bakeries are sold to interested parties. Reselling of scrap materials in the Columbus plant alone returns thousands of dollars annually.

Sale of used white flour bags, for example, has been so successful that it has become a problem to accumulate enough of them to fill orders. The first day the bags were sold at Columbus and its surrounding branches, less than half of the orders were filled. Sales were then discontinued for about three weeks so that enough bags could be accumulated. When sales were resumed, 6,300 bags were disposed in one day. Again, this number fell short of what was needed. Sales were then scheduled for Wednesday and Thursday of each week. Now, approximately 4,500 bags are sold each week in Columbus alone.

Enlightened Public Relations

Purpose of Omar's public relations program is to let the public observe the quality safeguards taken in the manufacture of bakery products, cleanliness of the plant, efficiency of the equipment, and the pride the employees have in doing their work. Equally important is the opportunity the plant visits provide in enabling the company to gain more customers.

Biggest plant visit was the celebration of open house this spring at Columbus to dedicate the $1,500,000 addition to the bakery and the $600,000 expansion of the Central Ohio distribution centers.

A route through the two-story bakery was arranged to give the visitors a first-hand view of the operations involved in making bread, pies, cakes, sweet rolls, and doughnuts. Several on-the-spot radio broadcasts and an array of door prizes lent a festive air to the occasion.

Reason for the huge open house, which lasted seven days, were the numerous requests from customers and friends to tour the bakery while the new addition was being made. So, the company decided to let everyone see the improvements. And they did—more than 58,000 people came from all over Ohio.

The influence of this opening on sales volume was demonstrated a few weeks later, for the use of invitation cards as a source of getting more customers produced gratifying results. These cards were broken down into cities and routes. They were turned over to the salesmen, who then contacted the new prospects.

But this method of getting new customers did not stop here. For every evening, sales supervisors checked on the salesmen, who were asked: How many prospects were contacted? What is being done about those who were not reached? What did the new customers buy? And what were their reactions to Omar products and the bakery?

Because the open house was so successful, three daily plant tours have now been set up, arranged by appointment with the personnel department. Tours are conducted by hostesses in attractive uniforms.

Among groups visiting the plant are: Students and teachers, Boy Scouts and Girl Scouts and civic groups like the Lions, Rotary, Kiwanis, and women's clubs.

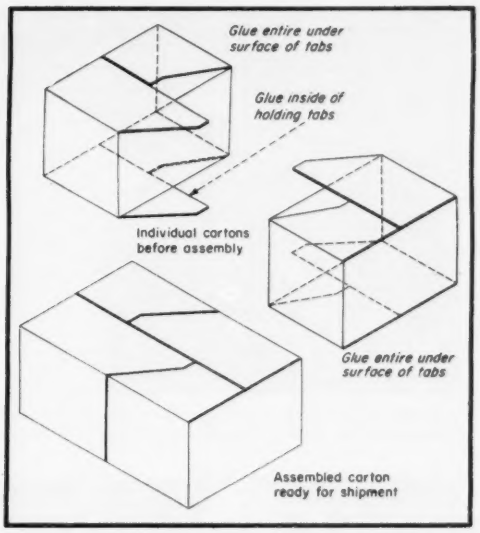
For those unable to visit during the day, special tours are arranged for the evening. Among those making these evening visits are the Naval Reserves, Credit Union Associations, and various office and factory workers.

Efforts to promote plant visits are thorough. Salesmen pass out invitations to their customers and prospects. Hostesses solicit visits through correspondence.

Registration cards—another selling tool—are signed by the visitors, who are asked to give their addresses. These cards go to the sales department.

Full, half, and knockdown

And how it goes together


Glue entire under surface of tabs
Glue inside of holding tabs
Individual cartons before assembly
Glue entire under surface of tabs
Assembled carton ready for shipment

TWO-IN-ONE CASE comprises half cartons, each holding 24 cans. Special top and bottom flaps lock both units into a single case that is identical in size to conventional one used to pack 48 cans of baby food.

Needn't Break Lots With This New Case

Comprising two units—each a shipable package—special interlocking carton is Gerber's answer to market demand for half cases of baby foods

C. R. HAVIGHORST
Associate Editor, "Food Industries"

To meet the growing market call for half-cases containing 24 5-oz. cans, Gerber Products Co., Oakland, Calif. recently developed a special interlocking case to take the place of the conventional container holding 48 cans.

The new case is actually a double package—a combination of two shipping units each containing 24 cans.

To baby-food processors, packing 5-oz. cans 48 to a case was originally the most efficient and economical way to do the job. But soon wholesalers realized that some customers did not want to buy full cases of one kind of baby food. Instead, they preferred to stock up on a wide variety.

Consumer preference, lack of storage or shelf space, and changes in the methods of retail-inventory control accounted for the retailer's desire for half-cases. And as the demand for baby foods increased, the load on wholesalers' "broken-case" or "broken-lot" departments grew heavier. This meant that these departments had to cut each case in half and either put the remaining 24 cans in a paper bag or wrap and glue paper over the open ends of each half-case.

Knowing that the job of breaking open cases is a costly and inefficient operation—and one that might reflect in lost sales volume—Gerber made its first attack on the problem well before World War II.

This initial modification of its operation actually involved the use of five cases. Four light chipboard cases were filled with twelve cans each, and these were then packed in a heavier shipping container before going to the gluer and compression units.

First Change Too Costly

But this change was not satisfactory because casing costs had skyrocketed. Cost of casing this way was out of line, since it was necessary to use four additional cases, more printing, and an extra operator. In addition, the outside case had to be larger to accomodate the four smaller ones. Shipping weight, too, increased considerably.

Then, World War II intervened, forcing the company to return to its original single case for the duration.

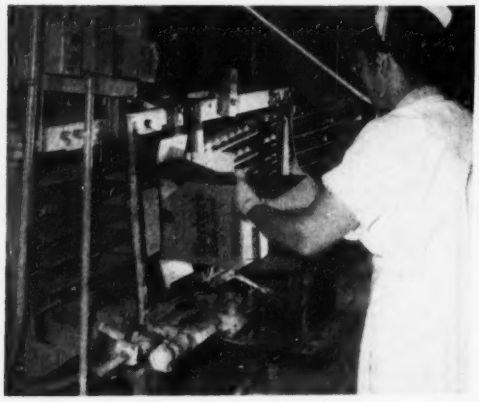
The second change came in 1948, when paper supplies were again available. At that time, a triple-case arrangement was tried. This time, two light chipboard cartons, each containing 24 5-oz. cans, were packed in a shipping container.

Again, an additional operator was required on each line to insert the two cartons into the shipping case. And here, too, casing costs were too high. Manufacturing costs increased about $40 for each 1,000 containers. Additional costs were attributed to the need of extra packing equipment, storage space, and labor. And on top of this, the shipping weight of each case increased about 12 oz.

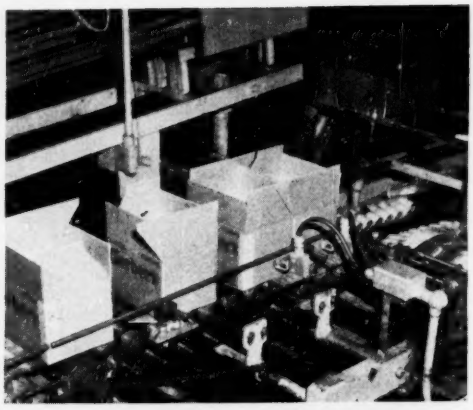
Special Case Designed

The problem of developing an efficient and economical container was then given top priority in the engineering department of the Company's Oakland, Calif., branch. The answer was reached in this third try—in the

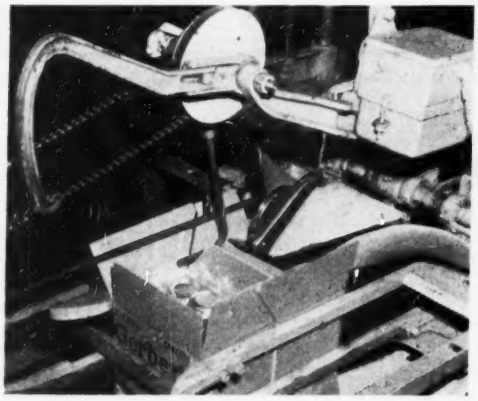
Six Major Changes Were Made on Packing Line



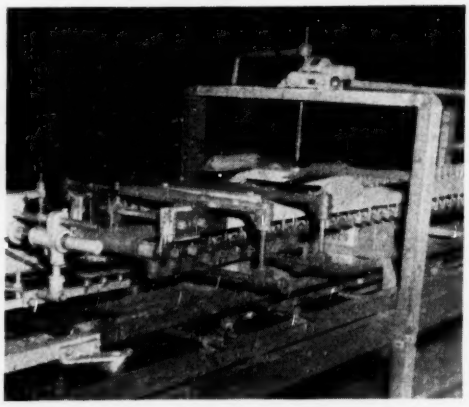
1 **SEMI-AUTOMATIC** case packer was adjusted to enable attendant to pack 24 instead of 48 cans into a case.



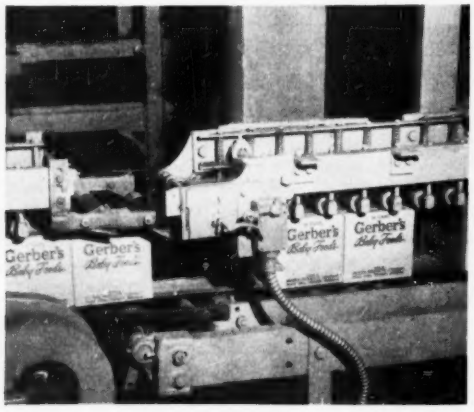
2 **ROLLER SECTION** leading to gluer was changed to prevent cases from congesting at gathering device.



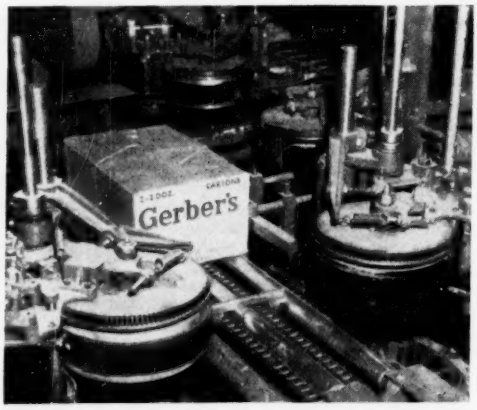
3 **ANOTHER** folding arm was attached to sprocket of original arm to tuck in the additional top flap.



4 **A 12-FT.** section of compression unit was made part of gluer to completely set adhesive.



5 **LIMIT SWITCH** (center) actuates bottom belt of compression unit (left) to keep components together.



6 **PRINTING DEVICE** at end of compression unit was redesigned to make imprints on each half case.

form of a special case that Gerber trademarked the "Interlock".

This new container meets all the requirements because it comprises a two-compartment case—either part being a shipable unit. The case is termed "Interlocking" because each 24-can unit has two tabs—one at top and one at bottom—which lock into recesses of the "partner" case.

These flap-extension type tabs (see drawing) are formed out of the conventional inner flap, so that a minimum amount of board is used. The two small cases, when sealed and glued together, form a single case identical in size to the one formerly used for 48 cans. Only difference is the addition of the two sides that divide it into two 24-can units.

The cut-away portion of the inner flap is useful in assembling the Interlok case. Glue is continuously applied to all flaps and extensions. And to facilitate opening it, the container manufacturer applied a spot of ink on the flap at the center of each carton. Since glue will not adhere to this spot, it provides—when depressed—a place for purchase by tool or finger.

Another feature: If desired, the interlocking case can be made up of more than two units. Here, one requirement is that the final package has a shape suitable for handling—palletizing and warehousing. Another is to have each unit, after division, form a desirable take-home package (should the commodity lend itself to this form of sales appeal).

Equipment Had to Be Changed

In reality, development of a satisfactorily designed case was only half the battle. Semi-automatic filling, automatic gluing and subsequent compressing of the flaps presented problems entirely different from those encountered with conventional cases.

The two small cases had to be gathered automatically in two's and carried through the gluer, where the additional top and bottom flaps could be folded outward and glue automatically applied. Also, these components had to be joined perfectly—squared together—after the flaps were folded into place as they traveled from gluer through compression unit. And since there were two cases, the printing device at the end of the compression unit had to be redesigned.

Just what mechanical alterations and additions these machines needed had to be determined experimentally. To find out, it was necessary to run the interlocking case through the packing line. As an outcome of these trial runs, six major changes on the conventional packing equipment were prescribed.

First was an adjustment of the semi-automatic caser so that it could fill each carton with 24 instead of 48 cans. Second change was to devise means of keeping cases from congesting and disturbing the action of the case-gathering device. To do the latter, it was necessary to redesign the initial roller section leading to the gluer. This section now consists of eleven rolls. The first two are idler rolls. Following these are two driven rolls. Next, there are two additional idler rolls, which are followed by five driven rolls. Purpose of alternating driven and non-driven rolls was to accelerate the two 24-can cases so that they could be timed into the gathering device, simultaneously leaving gaps between the running pairs. Automatically, a device enters the gap and stops oncoming cases after the gathering unit releases the twin package going to the gluing mechanism.

This automatic gathering device has three limit switches and two solenoids. The electrical circuit is arranged so that two limit switches are actuated by two 24-can cases. The third switch is actuated by a cam, which is timed with movement of spacing bars on the gluer. When all of the switches are closed, the solenoids are energized, and then the two cases are picked up by a spacing-bar and carried to the gluer.

In addition, a fourth limit switch—normally closed—is mounted so that it is actuated by the bottom flap extension, if the packer operator happens to reverse a case. This device prevents a half-case from entering the gluer.

With conventional cases, only one top-flap must be folded forward by an arm. However, the new double case has two flaps that must be folded in this direction.

How Flaps Are Folded

To do this called for the third change on the packing line. It was necessary to attach a second folding-arm to the same sprocket containing the original arm. Moreover, the forward flap of each second case is notched to permit the second arm to contact the back flap of the first case. Then, in sequence, the leading inner flap is closed by the plow, the second flap by the first arm, the third flap by the plow, and the last inner flap by the second arm. The drive for the folding-arm was taken off the front shaft of the gluer so that its action is accurately timed.

To handle cases of more than two components, it is only necessary to add more limit switches on the timing conveyor and more flap closing arms and then increase the length of the tapered roller timing section.

Guides were also added to hold the outside flaps open while closing the inside ones. At the entrance end of the gluer, half of the original plow was removed and replaced by an additional plate and roller. The latter quickly closes the front flaps, thus getting them out of the way of the second arm.

The spacing-bars conveying the two-unit case through the gluer are connected to two chain drives that operate in channels at each side of the machine. Neither top nor bottom belts are driven in this unit. The chain drives move over slotted sprockets that are bolted to hubs keyed to the drive shaft. With this arrangement, cases are always tightly pressed together, and they are kept in proper alignment while being conveyed through the machine.

Setting the Glue

Now to the fourth major change—setting the glue. To facilitate effective setting of the glue, a 12-ft. section of the compressor unit was made a part of the gluer. Another 12-ft. section of the conventional compression unit was added. Glue-roll cams were then disconnected so that the gluer now operates continuously.

Today, the interlocking cases are smoothly conveyed through this entire machine. At the transfer point—between the gluer and the compression unit—the glue is only partially set A dead plate and also additional, more closely spaced rolls were added to insure a level transfer and to provide better support for case bottoms.

To keep cases from being separated by the forward action of the bottom belt of the compression unit—as they move onto it from the gluer—the fifth major change was made.

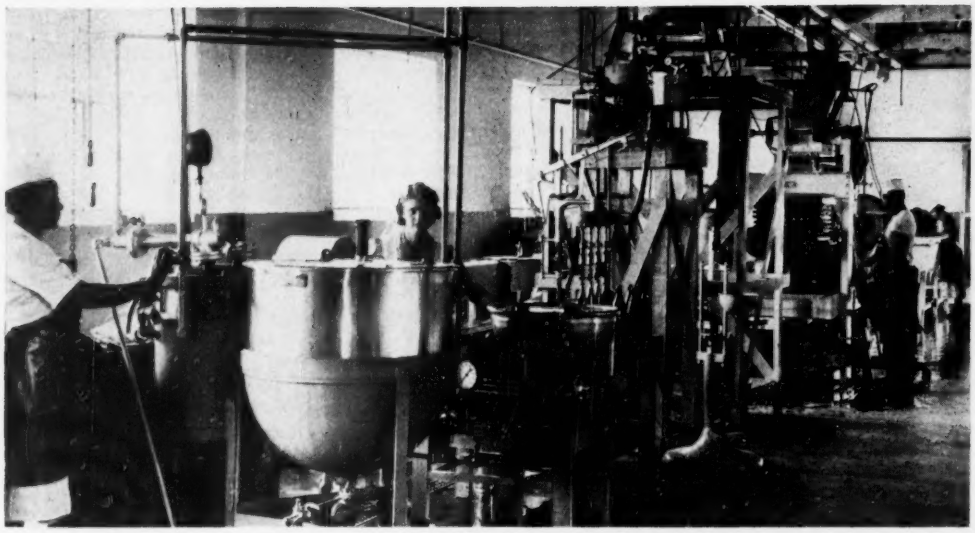
This conveyor is now actuated by a limit switch. And the bottom belt of the compression unit has been extended so that the leading edge of each case contacts the limit switch just as the back is discharged from the gluer. The limit switch starts the bottom conveyor of the compression unit, and the case moves smoothly into the machine.

The conveyor is not in motion when a case is discharged from the gluer. It moves only when the case is disengaged from it.

Printing Unit Altered

From the compression unit, the case is then discharged into a four-head printer that puts the name of the product on outside faces of the case. Here, came the sixth, and final, major change: A double die was installed on the second set of heads to print each individual face of the component parts of the case. In addition, a 1½-hp. motor was substituted for the usual ¾-hp. drive of the conventional type gluer and compression units.

(Turn to page 190)



IN THIS test plant at Georgia Experiment Station, promising new muscadine grape foods are coming off the pilot line. Processing units for making jelly and preserves are in foreground. Grape juice line is in the rear.

Reveal New Uses for Muscadine Grapes

Pilot plant has successfully produced beverage juice, jelly, preserves, sauces, and a frozen-filling product from this Georgia vineyard crop

E. DALTON WHITE
"Food Industries" Special Correspondent,
Atlanta, Ga.

The Georgia muscadine grape is being turned into new value as a food crop. Facilities for pilot plant operations have been installed at the Georgia Experiment Station for making a beverage juice and also several other products from this grape. In short, the muscadine grape is offering promising possibilities for expanded use in the food processing industry.

In addition to grape juice, the plant has produced jelly, preserves, frozen grapes for pies and ice cream, muscadine spiced sauce, and a meat sauce. And experiments are underway to make frozen concentrates.

The grape juice pilot plant, handling 1 ton of grapes in 10 hr., was erected at the station two years ago. In this miniature plant, grapes are cleaned, graded, washed, deseeded, and pressed. Then the juice is blended, pasteurized, filtered, and bottled. For more complete utilization of the grapes, additional equipment was installed to make the jelly, preserves, and other specific products.

At the pilot plant, the grapes pass along a variable speed-drive inspection table, through a rotary spray washer, and up a shop-made chain elevator with cleats. Grapes then fall into a hopper feeding a crusher, which is located above a press.

The crusher consists of a cylinder with teeth. As the cylinder turns, it crushes the grapes passing through it. The crushed product is then directly funneled into press forms.

Processing the Juice

Six 18 x 18 x 2½-in. forms are pressed at once in a hand-operated, hydraulic unit. Press accessories enable the operator to load one stack of forms while another is pressed.

From the press, the juice is pumped into two holding tanks—one for hot-pressed and the other for cold-pressed juice. Next, the juice is pumped into a stainless steel blending vat. Here, each 100 gal. is adjusted for acidity, sweetness and color. Then the juice goes to a pasteurizer, where it is heated to 190 deg. F. in 2 min.

Pasteurized juice is then pumped through a small drum-like vertical filter that has four 10-in. dia. plates with coarse filter paper. Finally, the juice is bottled.

Extensive experiments were carried out during the first year. Prime objective was production of a high quality product economically. In these experiments, cold- and hot-pressed grapes, clarified with and without filter aid, were used.

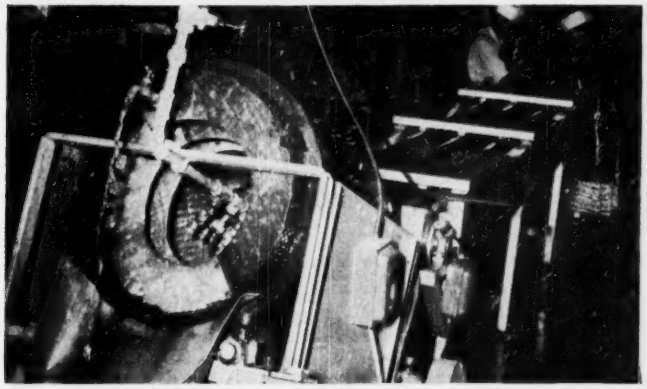
Removing Sediment

It was found that the addition of pectin or sediment-producing enzymes to the strained but unfiltered juice was of little value in reducing the amount of suspended solids. Furthermore, these clarifying agents did not curb tartrate or sediment that com-

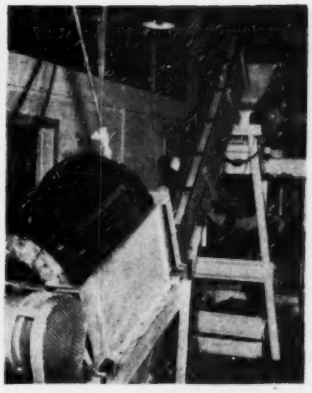
TABLE — HOT-PRESSED GRAPES, Clarified With Filter Aid, Produces the Most Juice

Grapes (Lb.)	Pressed	Filter Aid	Juice Yield (Percent)
3,558	Cold	None	50.9
6,870	Cold	Used	56.6
1,998	Hot	None	59.6
2,859	Hot	Used	61.6
Total 15,285			56.6

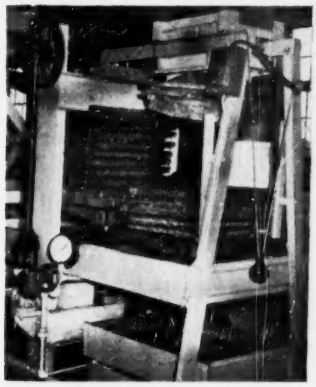
MUSCADINE JUICE: From Fresh Grapes to Final Beverage



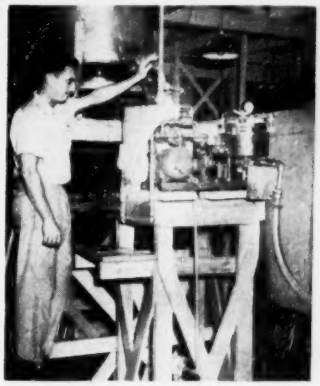
1 **GRAPES,** graded at inspection table (rear), are conveyed through rotary washer (foreground) and chuted into deseeder.



2 **ELEVATOR** (rear) carries grapes to crusher directly above press.



3 **HYDRAULIC UNIT** presses the juice from crushed, deseeded fruit.



4 **JUICE** goes from blending tank (top) into pasteurizer and filter.

5 **FILLED** and capped, bottles are ready for product appraisal.

monly form in bottled juice after a few weeks' standing.

Sediment was eliminated by permitting the juice to settle at 38 deg. F. for a week and then decanting. The color and flavor of the bottled juice was retained much better when it was stored in a cool, dark place.

Further experiments indicated that it was impossible to clarify the juice completely by unaided filtering. However, by adding 1.5 percent filter aid (Celite No. 545) to the crushed grapes before filtering, it was possible to clarify and "polish" the juice to crystal clearness. Moreover, the yield of the juice was increased, the juice flowed more evenly from the press, and peeling the cake from the press cloth was facilitated.

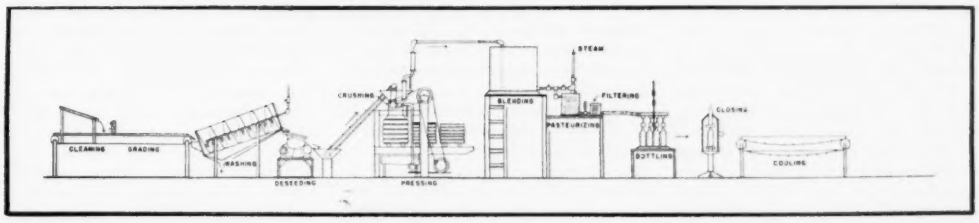
Yield Figures Cited

Filter aid increased the yield about 2 percent on the hot-pressed juices (see accompanying table) and 5 to 6 percent on cold-pressed juices. The average was about 4 percent for the blended juice.

A total of 15,285 lb. of grapes was pressed, yielding about 56.6 percent juice. The average yield was 58.1 percent with filter aid and 54.0 percent without filter aid.

Considerable difference in color as well as yield was noted between hot and cold pressed juice. Some of the

Twelve Steps in Making Muscadine Juice



difference was due to the variety and degree of ripeness of the grape.

The most desirable color and flavor, as well as highest yield, were obtained by blending 70 percent cold-pressed juice with 30 percent hot-pressed juice. Although the cold-pressed juice had a sweeter taste and a more fragrant aroma, it lacked color, body, acidity, and tartness. In hot pressing grapes—heating them to about 125 deg. F. and then pressing hot—the heat breaks down the pulp to produce more juice with a richer color.

It was learned that sugar content increases and acidity decreases as the grapes ripen. Also, the percent of sugar and acidity varies with the variety.

Sweetening the Juice

Taste tests indicated that the preference was for juice with about 16.8 percent solids (as dextrose) and a total acidity of 80–90 (normalcy x 1,000). To obtain such a juice, it is necessary to blend different varieties to produce the desired acidity and to add up to 3 percent of dextrose to get the desired sweetness and body.

Experiments with sucrose were unsatisfactory, since the sweetness masked the delicate natural grape flavor. Also, the addition of 1.5 percent dextrose and 0.5 percent sucrose was not as satisfactory as the addition of 3 percent dextrose.

While bottled muscadine juice is normally red, it becomes purplish after it is opened. This color change is due to oxidation, which is catalyzed by the presence of metals. Iron in processing lines greatly accelerates this change. Copper and aluminum have the same effect, with aluminum being the worse offender. The color change is also accompanied by a marked reduction in the flavor.

Ascorbic Acid Retains Color

In experiments seeking a way to preserve the natural color and to prevent oxidation of the flavor, use of ascorbic acid found favor. In the first test, 200 mg. of ascorbic acid were added at the crusher to each pound of grapes. In another test, 180 mg. of ascorbic acid were added to each pound of juice just before it was pasteurized.

It was learned that about 25 percent of the added ascorbic acid was lost during pressing. An additional loss of 10 percent occurred during the blending of various press fractions, also another 5 percent in filtration.

By adding 10 oz. of ascorbic acid per ton of grapes and figuring a 58 percent (by weight) yield, the final juice contained about 30 mg. of ascorbic acid per 100 ml.—the desired standard.

Loss of ascorbic acid added to the blended juice before it was pasteurized, filtered and bottled amounted to about 20 percent. The addition of about 5 oz. of ascorbic acid per 100 gal. of juice is required to produce a finished juice with 30 mg. of the acid per 100 ml. Calculated on a tonnage basis, this runs to about 7 oz. of ascorbic acid per ton of grapes.

Hence, about 40 percent more ascorbic acid must be added before pressing than is added after the juice is collected. This 40 percent is just that much additional protection against oxidation during processing.

Favorable Grape Varieties

The Georgia Experiment Station maintains a vineyard, where new varieties of muscadine grapes are developed and old ones are perfected. The Hunt variety, developed by H. P. Stuckey and further improved by Mathew W. Murphy, appears to be the best producer. Another good producer is the scuppernong.

Better, Faster Washing Achieved With Synthetic Detergent

Solving of tuna packer's oily-can problem —with no rewash needed and plating of cans unharmed—is latest stride with surface-active solutions

ALLEN I. BARRY
Chemical Engineer, Eastport, Me.

Tuna cans that remained oily after packing and sealing—even after washing with a standard alkali cleaner—posed a problem at Riviera Packing Co., Eastport, Me.

But substitution of a synthetic detergent solved the difficulty, reflecting the versatility of the new chemical detergents.

The Eastport company had set up its tuna line to utilize sardine packing facilities during the off season. At first, after sealing and spray-rinsing, oily tuna cans were washed in boiling water containing 1 percent sodium metasilicate, and then pressure-cooked.

But considerable pack oil is required for tuna. And when the cans pass through the sealer, they become heavily coated with excess oil. The alkali cleanser did not remove the oil completely, and after cans came out of the pressure cooker, a second wash and inspection was necessary.

A stronger alkali solution and a longer washing time were considered—but were rejected because can plating might be attacked, causing darkening. Then the company made special tests by suspending oil-coated tuna cans in various synthetic detergent solutions.

Answer was found in a combination synthetic detergent and wetting agent—an alkyl aryl sulfonate—plus a small amount of TSP (the alkali trisodium phosphate). Solution of detergent is between 0.3 and 0.5 percent. The TSP is added to maintain a pH between 9 and 10. This solution is relatively harmless to the can.

In operation, the wash solution is kept at boiling point by live steam. Cans enter on a conveyor from the sealer, and emerge free of oil.

Agitation produced by boiling gives all the mechanical action needed. Temperature of the boiling solution does not affect can plating more than can be expected in plant operation. Solution needs only slight additional make-up for the next batch of cans. Quantities of detergent are not too critical, therefore are measured by volume in galvanized pails.

After using this method for a short while, it was found possible to cut down the washing time, and so speed up the production line.

Theory of Synthetic Detergents

The effectiveness of a synthetic detergent is simply explained. One portion of each molecule is hydrophilic (water loving) and another portion is lipophilic (oil loving). Thus, the detergent forms a link between the water and oil. Adherence of the oil to the metal surface is lessened. Oil is washed off and breaks into minute globules which remain suspended in the wash solution. Subsequent mechanical and rinsing action removes the oil without redeposition.

Ultraviolet Tubes Protect Product at These Vital Points

HERE, 25 electric germicidal tubes keep the processing room free of bacteria during entire treating time. Lamps are systematically arranged to produce a complete and effective blanket of light. Product uniformity is now best ever.

SORTERS cull cherries. When operators leave, conveyor is kept under constant germicidal bath from lamps above.

THIS LAMP, installed at filling station directly above barrels, protects cherries during packing operation.

Rays Curb Bacteria, Boost Fruit Quality

Michigan packer effectively guards cherries with germ-killing lamps strategically placed to cover product in process, all exposed areas, and surrounding air

J. NELSON and I. MATELSKY

Respectively, Quality Control Chemist, Howard Black Cherry Co., Traverse City, Mich., and Bacteriologist, General Electric Co., Nela Park, Cleveland

A simple, economical radiation technic now makes it possible to deliver packed cherries virtually free of bacteria from the Howard Black Cherry Co., Traverse City, Mich.

Contamination of products by airborne microorganisms is prevented by processing under germicidal rays. This is done by irradiation of—

- **Product in process, to inhibit or kill organisms on its surface.**
- **Surrounding air, to reduce number of floating organisms.**
- **Ceilings, walls, floor, and other exposed areas, thus killing or inhibiting growth of bacteria, yeasts and molds and removing main sources of airborne contaminants.**

Company President Black's move was toward greater use of cherries in ice cream manufacture. He aimed to have the fruit meet the standards of the highly sanitary dairy field.

Systematic placement of the germicidal tubes gives intense irradiation of the air in the processing rooms during the time when no personnel is present—16 out of 24 hr. on work days, continuous over week-ends. And the following results have been observed over a 12-month period: (1) Total counts declined well below 500 per cc., (2) Coliform counts dropped to zero, (3) Mycoderm scum was absent from the surface of processing cherries, and (4) Mold growth was gone from walls and surfaces of casks.

Thus this packer has concluded that germicidal ultraviolet air and surface disinfection is a prime adjunct in good plant maintenance and housekeeping. To reduce spoilage, processing dishes, pans and casks must be scrubbed to assure bacteriologically clean surfaces. And plant air must be given same attention as equipment.

GARAGE AND TRUCKS went along in switch from dairy company operation to new rental arrangement.

Dairy Truck Leasing Gets Good Foothold

Fluid milk and ice cream distributor turns over all its trucking worries to drive-it-yourself group

FOREMOST DAIRIES, one of the leading dairy and ice cream processors of the South, is using a fleet of 50 leased trucks for all fluid milk and ice cream deliveries out of its plant in Birmingham, Ala. In fact, it has now been using these trucks for over a year, operating on a 5-year contract signed on May 21, 1949 and expiring on the same date in 1954.

Headquarters for the company's milk and ice cream plant is in Jacksonville, Fla. The organization operates combined milk and ice cream plants or separate milk or separate ice cream plants in Daytona Beach and Orlando, Fla.; Savannah, Atlanta, Columbus, Thomasville and Valdosta, Ga.; Charlotte, N. C.; Spartanburg, S. C.; Sharpsburg, Pa.; and Montgomery and Birmingham, Ala. While each plant is operated as a separate entity, there is overall control from the head office Jacksonville.

Remote Control

The automotive policies of the company as regards both truck maintenance and operation are also determined at Jacksonville. This covers details of acquisition of all trucks and automotive shop equipment and supplies. The Foremost company thus very definitely has the problem of the remote control of its automotive equipment at all plants outside of Jacksonville.

Certain of those automotive policies and details of controls set up to measure truck delivery production and maintenance costs, together with methods of operation, were described and illustrated in FOOD INDUSTRIES for August, September and December, 1942. These articles, however, covered company-owned trucks exclusively.

The problem of using leased trucks instead of company trucks was discussed between Paul E. Reinhold, president of Foremost Dairies, and O. H. Bradbury, sales manager of the Dixie Drive-It-Yourself System, Birmingham, for over a year prior to the signing of the leased-truck contract.

Under the arrangement, Dixie agrees to provide the number of retail and wholesale milk trucks and ice cream trucks desired by Foremost. Dixie will also paint, letter and maintain them ready for work as specified by Foremost. The fee consists of a stipulated amount per week per truck, according to size and type, plus a stipulated amount per mile per truck, again according to size and type, for all miles driven.

Dixie further agrees to maintain sufficient spare trucks to allow for repainting and relettering the active trucks once a year; for major overhauls; and for replacements following route breakdowns or accidents, thus assuring Foremost continuity of delivery service as required. Dixie charges for replacement vehicles only when used, on the same basis as the active trucks, except that on route breakdowns, Dixie makes no charge to Foremost for the relief driver taking the replacement truck to the place of breakdown.

Dixie keeps all of the trucks in good appearance, with adequate washings and in good mechanical condition, and it replaces worn-out equipment when necessary.

Moreover, Dixie agrees to garage the trucks overnight, to maintain a shop to keep them in proper condition, to provide all gasoline, oil and tires, to provide all licenses, to pay all property taxes and all fire and theft and public liability and property damage insurance.

"Where and When Wanted"

In effect, the dairy company gets the required number of trucks, where and when wanted, all kept in good appearance and mechanical condition, with adequate spares to assure continuity of operation—all for a stipulated weekly rental fee per truck plus a stipulated amount per mile for all miles run, with no minimum or maximum guarantee of mileage.

The drivers are hired, paid and

supervised by Foremost. Dixie has no control over the drivers, except possibly to suggest the elimination of such drivers as have proven bad accident risks.

Buys Old Trucks

As is the case with all truck-leasing negotiations, the first question the owner asks is:: "What am I going to do with my present trucks?" And the lessor's answer always is: "We'll buy them from you for cash at better than their current book values." Such was the case in the Foremost-Dixie deal.

Dixie paid $60,000 for the 43 trucks then in service at Foremost's Birmingham plant. In addition, Dixie also bought for cash all Foremost garage equipment and its stock of parts, supplies and tires, and it prorated the cost of licenses and insurance on the trucks, which already had been paid for the year.

Dixie also rented Foremost's garage. Thus, the trucks are maintained and painted in the same building as that from which the company-owned trucks were serviced previously. The total investment in the deal reached approximately $100,000.

At the start, Dixie took over all the dairy's garage employees. This was considered a wise move in that these garage mechanics and helpers were already familiar with the Foremost maintenance. Then, too, no Foremost man lost his job in the transition.

Change to Paper Containers

The trucks purchased included Chevrolets, Internationals and Diamond-Ts. All replacements are to be Chevrolets. Twelve of the trucks purchased were replaced within the first 30 days by new Chevrolets equipped with mechanically-refrigerated bodies to accommodate a Foremost change in operation from glass bottles to paper containers. In fact, it is said that the Dixie money received by Foremost in the leasing transaction was used to finance part or all of the transition from bottles to paper containers.

Because cracked or flaked water ice previously used on bottles in wooden cases as a refrigerant is not suitable for paper containers because the latter soften when wet, refrigeration in all new leased trucks is to be either semi or fully mechanical.

Since the signing of the contract, Foremost has added seven new routes so that there are now 50 trucks under lease. Of these, 47 are used on retail and wholesale milk routes and 3 for ice cream deliveries. The wholesale milk bodies are refrigerated to a maximum of 50 deg. F. by the use of two Dole Kold-Hold plates and a 1 hp., 220 v. single-phase compressor. The ice cream bodies are low-temperature vehicles that are also refrigerated by the cold plates.

Besides the beneficial release of capital investment, Dixie claims that four basic advantages will accrue to Foremost by reason of the leasing contract, as follows:

1. Executives will have more time to devote to the company's basic business.

Such management duties as the handling of insurance and licenses and the purchase of vehicles, gasoline, oil, tires and supplies will be eliminated.

2. Delivery expense can be budgeted in advance. There is just one bill for everything, based on the weekly rental for each truck plus a specified charge for each mile the truck travels.

Since each truck covers the same route daily, the mileage cost can be pre-calculated. A mileage check of each truck at the end of each day also deters the drivers from excursions off the route, such as going home for breakfast every day and for lunch on collection days. This was prevalent previously, and if corrected there will be a considerable yearly saving.

3. Truck maintenance worries will be eliminated.

Dixie maintains all the equipment and makes repairs when needed at no additional cost to Foremost. If a truck breaks down on the route, the driver calls Dixie, not Foremost. Road service repairs are made by Dixie. Or, if necessary, a substitute truck is sent out to enable the driver to complete his route. The disabled truck is then towed back to the garage for repairs and the only additional cost to Foremost is the mileage charge back to the garage for the broken-down truck.

4. The leasing contract assures well-maintained and good-looking trucks.

Repainted and relettered every twelve months to Foremost specifications, the vehicles to all intents and purposes are company trucks.

Bearing in mind that all Dixie services rendered for which no additional charges to Foremost are made are included in either the weekly or mileage rates and that Dixie must earn a profit on all the services in order to stay in business, the owned vs. leased truck maintenance problem resolves itself into one of comparative cost.

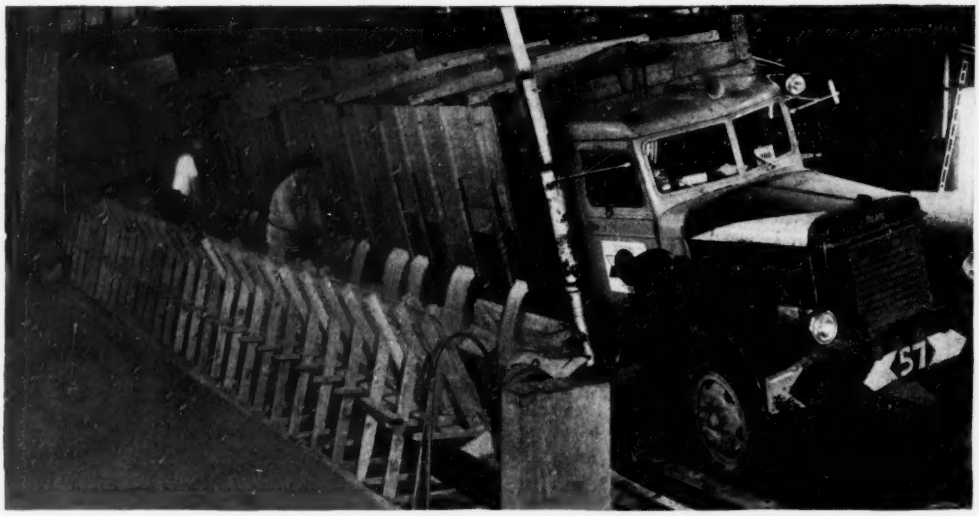
Weighing the Factors

On the one side there is the expense of operating an automotive department without profit, with a manager capable of selecting and ordering the most economical equipment and of setting up and maintaining controls to limit all garage, repair and painting expense through supervision of shop foremen and clerks as required, all to the end that top management be relieved of all automotive details, such as insurance, getting licenses, and purchasing all supplies.

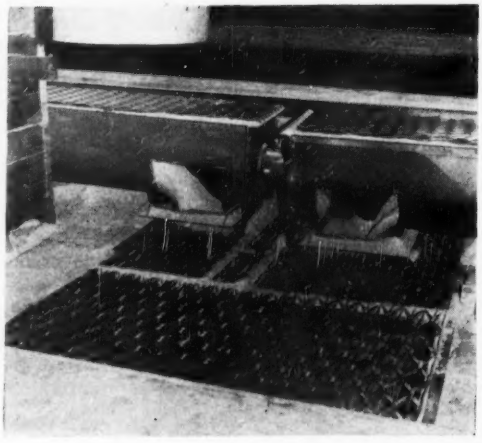
On the other side, the selection of the proper equipment remains with the top management but its procurement and maintenance rests with a lessor operating at a profit. The smaller the fleet, the more difficult it is for the owner to maintain his own automotive department at comparable cost because of too few vehicles over which to spread the overhead. The larger the fleet, the better are the owner's chances of operating his own automotive department at a lower net cost.

Where the dividing line is to be found, as regards optimum economy, depends on many variable factors, no two cases being the same. In the Foremost case, FOOD INDUSTRIES looks forward to publishing, some time after May 21, 1954, the net results of the current 5-yr. leasing contract.

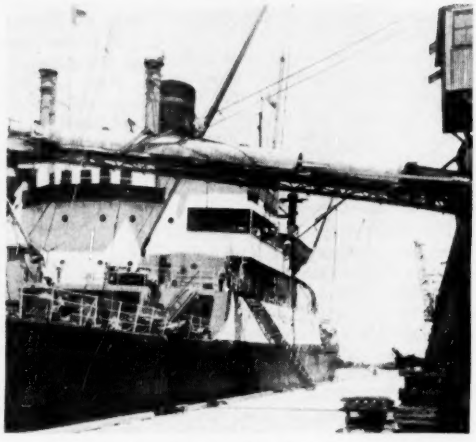
DAIRY DRIVER continues at the wheel although the truck—a brand new one—is supplied by lessor.



Trucks discharge bulk rice by gravity into 14-in. screw conveyors



Then conveyors pour rice into pit



And marine leg carries it to ship hold

Bulk Rice Shipments Save Time, Money

HISTORY was made at the Port of Stockton, Calif., from June to August this year when 60,000 tons of milled brown rice moved in bulk to Japan. Normally, all export milled rice is shipped in bags, but costs forced the U. S. Department of Agriculture and the U. S. Army in Japan to adopt bulk handling.

Savings in time accrued from quick turn-around of trucks between Sacramento and Stockton, and rapid loading and unloading. Saving in sacks alone totaled about $200,000. Saving in inland transportation through use of the Port of Stockton amounted to about $108,000.

At the Sacramento mills of Rice Growers Assn. of California, milled brown rice was bulk-loaded into trucks and transported direct to the port. About 75 truckloads were delivered every day over an 18-hr. period to meet closely coordinated schedules of mill and ship loading.

At the port, equipment capable of bulk loading 100 tons per hour was devised and installed in four days from the time of notification of shipment of rice. Here is the quick, 3-step way the grain was handled:

A special 15-deg.-angle ramp, 180 ft. long, was installed to permit two truck units to unload simultaneously into two screw conveyors. Totaling 135 ft. in length, these conveyors delivered rice to a pit, from which it was elevated by marine leg and carried to the hold of the vessel being filled.

We Think . . .

■ Bread Standards Point Up Need for Answers to Basic Questions

Two basic questions remain without satisfactory answers as a result of the tentative order on standards of identity for bread. One is highly important not only to bakers but to other food processors. It has to do with the possible toxicity of certain of the chemicals which are not accepted by the proposed standard as satisfactory for emulsifiers or softeners. That is a question for toxicologists to answer.

Equally important to bakers is the second question: What happens when bread grows older, either with or without the presence of such chemicals? This problem is one for cereal chemists and nutritionists to study jointly.

Manufacturers of chemicals are somewhat at a loss in respect to knowing what they must do to prove that a chemical material is safe when used in foods. In some cases, animal studies and clinical tests carried on by such manufacturers and other interested parties have found no harmful effects. Yet the Food & Drug Administration has not been satisfied.

A cautious attitude on the part of F&DA is highly desirable. In fact, the Food, Drug & Cosmetic Act should be strengthened to provide that chemical manufacturers submit irrefutable proof of the harmlessness of new chemicals before they are used in foods. Addition of chemicals to foods as a substitute for positive technical control, as a substitute for use of best processing or marketing practices, or as a substitute for use of nutritive ingredients is a negative approach to the solution of a perishability problem. Sanction for the use of such additives should be difficult to obtain. The health of the public and constructive technological progress in food processing are at stake.

But it is extremely important that those interested in this problem shall get very definitely from F&DA a definition of the minimum set of test results which will be considered adequate in demonstrating the propriety of use of these chemicals from the standpoint of possible toxicity. Then those interested can decide whether they care to conduct such tests.

In the specific case of bread, little less difficult is the question of what happens when it stales. What happens as time passes? What is the meaning of what happens? If bread gets dry and hard, what causes this, and what are the secondary results? When such staling is postponed by softeners, what else happened? Has staling changed the dietetic value as time passed? And what has happened to flavor under each of many circumstances?

It would seem that a combination of cereal chemists and nutritionists could usefully and practically analyze these aspects of staling. And while the American Institute of Baking and others have been investigating the chemistry of bread staling, it seems that the bread industry should carry the worker further and faster.

An exhaustive study seems timely, because staling unquestionably results in a heavy economic loss to the baking industry. It may conceivably result in a dietetic loss to the consumers of bread in which staling has not progressed to the point of unpalatability.

■ Hang "Help Wanted" Sign Against Attractive Background

The defense program definitely is developing new demands for employees in many kinds of business. This means that before long you may have difficulty in hiring personnel in both technical and operating divisions. Two or three special problems need early consideration in this connection.

There soon will be the problem of hiring women for positions normally filled by men. If the heavy part of each job were mechanized, many food factories could use more women workers—and at the same time take advantage of feminine dexterity. A general plant survey from that point of view is desirable in food processing plants.

By a little advance planning, factories also can recruit workers who are somewhat handicapped physically or are in age groups older than normally hired. The apprentice period or the training time for such new workers may have to be a bit longer than with the young and vigorous. But experience during the last war period showed that older persons often are among the best and most stable workers.

Most important of all at this stage may be the job of planning the approach to people who ordinarily do not work. In many areas, the customary bulletin board, newspaper advertising, or other common methods of recruiting help will not be enough. Some areas very soon will require highly specialized searches for new personnel.

And an important factor in getting and holding employees is the establishment of plant working conditions which make the jobs attractive. Perhaps a program for the improvement of such conditions is the first step. This would assure employees a clean, attractive, well-lighted and well-ventilated place in which to work, and fresh uniforms to wear on the job. Then their workday "home" would to a pleasant environment.

It is not too late to capitalize on such conditions, but time in which to establish them is growing short.

■ Lee Marshall Demonstrated Value of Proper Perspective

As a rule, the top man in any company has a vision and perspective not shared by many persons. And usually that is why he is chosen for the top job. He seldom is afflicted by the common difficulty of seeing the trees but not the forest.

The late M. Lee Marshall of Continental Baking Corp. was one of the gifted executives who had the broad perspective. Few persons ever realized how great a contribution he made to the World War II effort by his ability to see the whole picture in War Food Administration.

Things were chaotic before Lee Marshall came in at the top echelon. And while to an outsider he did not seem to be doing very much, somehow the organization began to function shortly after he went to Washington.

One day we met him on a train and asked how he had done it. His modest reply was characteristic of the man.

The trouble, he explained, stemmed from the fact that policies were being made at the administrative level. Facing problems and lacking any policy to guide them, chaps who were hardly more than clerical employees would make decisions on pending matters. Then they would send memos "upstairs" that so-an-so was the policy henceforth.

With hundreds setting policies without reference to each other, or to higher echelon policies, it is understandable why chaos reigned and Washington jitters became commonplace.

Lee Marshall changed it all in a few days. He set up a policy board and required all and sundry to accept the board's policies—not write their own. It would be an unwarranted optimism to say that peace then decended on South Building of USDA. But the War Food Administration did begin to function as Congress had intended.

Mr. Marshall's achievement demonstrated the great merit in sizing up a situation in its integrated entirety, rather than taking a piecemeal approach. And it works in industry as well as in Washington.

■ Don't Yell "Wolf" to Suppliers Unless You Really Mean It

A recent study initiated by Packaging Institute should be watched with considerable interest, for it may be helpful to harassed purchasing agents. This study was requested by a user of packaging materials to determine how far in advance others are buying their packaging supplies.

The individual concerned presents his own firm's practice. If others are equally frank about current purchasing policy, the information can be helpful in allaying fears or reducing forward commitments to reasonable figures.

Another move to develop sanity in purchasing packaging supplies has much merit. Here the purchasing manager called in his principal suppliers, explained the purchasing policy of the past, and asked for cooperation on his plan. He offered to cut his normal inventories 30 percent so suppliers could handle more scare orders—*provided* the suppliers promised to meet his bona fide needs. All agreed without a moment's hesitation. That took nerve and mutual confidence.

Which brings up what a purchasing man of long experience once told us was the indispensable basis of successful purchasing. He said: "The most important factor is to win the confidence of suppliers and never try any 'fast tricks' or resort to chiseling or playing one supplier against another. One often can chisel lower prices on a falling market, but you always are forced to make up for it on a rising market.

"When we have any disagreements with our suppliers, we settle them without going to other sources. And when the suppliers have any bargains to offer, they come to us. We have sold them on our integrity and fairness through two World Wars and the Big Depression. That, my friend, is the essence of good purchasing."

Another comment from a purchasing expeditor also bears mention. It, too, involves the development of mutual respect and confidence. This man was yanked out of another job and told to expedite procurement. So he got on a train and called on the firm's principal sources of supply to learn why they were tardy with deliveries.

To his astonishment, he learned that the suppliers knew all about equipment lying in unopened crates for four months at one of his plants—equipment that had been ordered "extra rush."

Said one supplier: "When you folks learn to play fair with us, when you convince us that delivery dates are really important and the stuff will go into use at once instead of lying in the yard for half a year—then we will ship promptly. As it is now, we just figure you are buying far ahead, and our shipments are going to the folks who really need them."

There is no quick or easy way to build up respect and confidence. It takes both time and character. But it is well worth doing.

■ Business Men Should Support Red Feather Campaign

An outstanding job has been done by businessmen in selling their products but a dismal job in selling their companies, to paraphrase a statement by Father Keller of Notre Dame.

Perhaps it is because they have been too engrossed in giving consumers more for their money by improving quality and increasing production efficiency. But it is apparent that more attention must be devoted to convincing the public that American companies are run by people with warm blood in their veins and a genuine interest in the communities in which they operate.

One of the ways to show this human quality to good purpose is by supporting health and welfare agencies. But the great number of these agencies has made it difficult in the past to decide which ones to favor and how to distribute support equitably. Now these complications are removed. This year, Community Chests are uniting more than 15,000 health and welfare agencies in one big effort to raise approximately $190,000,000.

This is to help finance such typical Red Feather services as Boy Scouts and Girl Scouts, Maternity Homes and Visiting Nurses, Family Service, Travelers Aid, Neighborhood Houses and Legal Aid. Included too are Boys' Clubs and Camp Fire Girls, Urban League, Children's Aid, Hospitals and Clinics, and Services for the Aged. The Salvation Army, YMCA, YWCA, Summer Camps, Clubs for Girls, Aid to the Handicapped, and Social Hygiene Services are also members of the Red Feather family.

American industry's two well-known Charles E. Wilsons "believe in the 'many-in-one' campaign idea." The GE president is National Campaign Chairman, Community Chests of America. The GM president is vice-chairman of Community Chests. And here is what they think about the united campaign:

"Being business men, we see the advantage of uniting these many campaigns under one efficient, fund-raising organization. Industry knows that production costs drop as volume increases. Over 30 years' Chest experience proves that coordinated campaigns cost less, save time and energy and raise more money to provide more and better services. Big or small, federated campaigns guarantee effective use of the funds subscribed. They substitute order for the chaos that comes with many separate fund-raising efforts.

"United campaigns are wisely planned, cooperative undertakings. We believe they make sense and should be supported generously by all thoughtful business men."

We agree with our distinguished guest commentators.

PRACTICAL IDEAS

Shelves Adjustable on Freezer Rack

To facilitate freezing of various sizes of packaged foods, an aluminum rack with specially adjustable corrugated shelves was introduced at the Merchants Terminal Corp., Baltimore, Md. And its efficiency has now been attested in routine use.

Here is the procedure: Handling of the product is minimized by loading the rack on the receiving platform. Adjustable shelves are ranged under the top permanent shelf. The bottom shelf is loaded first. Then the lowest adjustable shelf is lowered close to top of containers on the bottom shelf, allowing a small air space. The second shelf is loaded next and then the others, until all, including the top permanent shelf, have been filled.

After loading, a standard hydraulic lift truck is rolled under the rack, it is hoisted, and the entire unit is then wheeled into the quick-freeze room. Rack is lowered into position with the corrugations of the shelves parallel to flow of air. A number of racks can be placed side by side and end to end.

After freezing, lift trucks are again employed to wheel rack to storage room, where the packages are unloaded and piled.

Details of the rack: Loading limitations are 400 lb. per shelf or 2,400 lb. per rack. Both rack and shelves have been designed with a safety factor of 4, with the shelves stiffened structurally to insure against failure during loading or handling, and to provide long service life.

Rack and shelves are constructed of high-strength aluminum alloy such as used in aircraft. Rack is so designed that when lifted, the support is on forward and aft rails and very close to vertical posts. An extension on the hydraulic lift carries out this support.

Adjustable shelves operate on solid aluminum rods at each end. The rods fit into slots in posts of frame. Slots are spaced about 2¼ in. apart. Brackets at the ends of the shelf have a slotted groove to facilitate moving handle out of slots in posts. Handles are used only to move the shelves into position for loading and are never moved when shelves are loaded.—*Jack Meagher, Merchants Terminal Corp., Baltimore 2, Md.*

$25 EXTRA FOR BEST ITEM

You are invited to submit Practical Ideas. You will be paid at regular rates when your item is printed and if it is judged best for the month you will get an additional payment of $25.

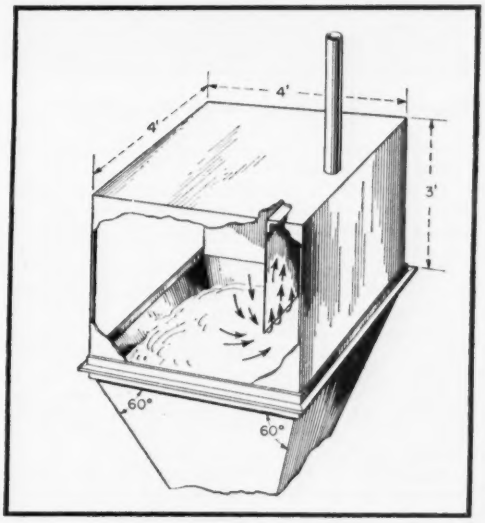
Selection of the best contributed item will be made by a group of 200 readers each month, and the item title and author's name will be cited (see below).

Practical Ideas may describe any type of device or method recently developed to solve a problem, speed an operation, or make some task easier. They may concern factory, laboratory, warehouse, or power-plant operations in the food industry. Ideas on management, maintenance, and trucking or shipping also are suitable.

You need not be an experienced writer or draftsman to submit these ideas. The text will be edited and sketches converted to finished drawings.

Send your items to: Practical Ideas Editor, FOOD INDUSTRIES, 330 W. 42nd St., New York 18, N. Y.

AUGUST PRACTICAL IDEA voted best was "Let Enzymes Help You Clean," submitted by Aloys L. Tappel, Dept. of Bio-Chemistry, Univ. of Minnesota, St. Paul.



Controls In-Feed Hopper Dust

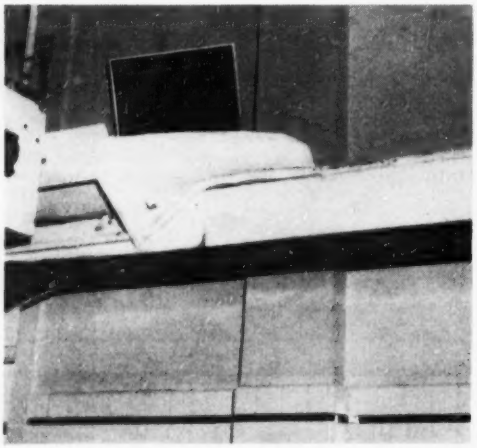
Dumping of sacks of materials into an infeed hopper can be a plant's major source of dust. But this can be controlled within a special hopper, easily constructed. Requirements may vary, but the hopper described should serve average needs.

The lower section of the hopper, shaped like an inverted pyramid, is constructed of welded sheet steel sloped at a 60 deg. angle with the base. Bottom outlet of the hopper is sized for entrance to a screw conveyor.

Angle iron is welded to the upper edges of the hopper,

and to this is attached a 3 ft. high, flat top hood, closed on three sides and open in the front. A sheet of metal is welded, 6 in. from the rear face, to the top and sides. This baffle should be 18 to 20 in. in depth. A hole of 3 in. dia. is cut in the roof, in the center of the compartment formed by the baffle, and welded here is a circular duct connecting with the dust removal system.

The open side of the hood section provides space for upending the bags to make dumping easy. Dust which normally results goes up the vent duct. If dusting is more than normal and still escapes, a canvas flap may be attached to the top edge of the open side and allowed to hang half way down the opening.—*W. A. Reed, Plant Engineer, Taylor Reed Co., Glenbrook, Conn.*



Operator Sees More With Mirrors

Machine operators are assisted by mirrors in the Fuchs Bakery, South Miami, Fla.

As bread pans emerge from the pan cooler conveyor, which is several feet above the floor, they pass by a large mirror and their reflection can be seen by workmen standing on the floor.

A pile-up of pans due to a jam can thus be seen. It otherwise might go undetected until someone raised a ladder and climbed up to the conveyor.

Jam-ups are not a common occurrence, but it is possible for a pan to fall off the edge of the conveyor and get caught, piling up the others.

Large mirrors also are mounted above the bread wrapping machines, to "cover" the sides opposite the operators. This enables observation of what is going on in the "behind" spots.

Glass mirrors were used for these applications originally, but these are now being replaced with large rectangular sheets of stainless steel which serve effectively as mirrors without being subject to breakage.

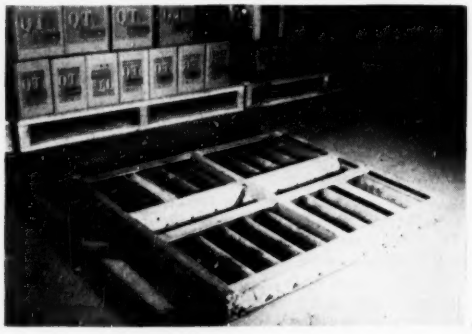
Good Safety Rules Mean Less Mishaps

There's a cause behind every accident. And every accident appears only on one side of the ledger—it's a loss for both the individual and the company.

The word to each worker is: Never take a chance on the job. Never risk your personal safety in an attempt to push production. Don't count on the other fellow, he may be counting on you. Carelessness, inattention or day dreaming may have tragic results. Always watch yourself, and think of the other fellow.

And here are 13 one-sentence rules for accident prevention:

1. Don't smoke except where smoking is permitted.
2. Horseplay and practical jokes are prohibited.
3. Never run in the plant.
4. Devices furnished for your eyesight protection must be worn when required.
5. Girls should wear prescribed hair protection.
6. Don't wear open-toed shoes, bracelets, or any loose jewelry.
7. Lift heavy objects with your legs.
8. Never attempt to adjust any machine until all power has been shut off.
9. Machines must not be run without safeguards in place.
10. Compressed air is vicious, hence don't play with it.
11. Protect the sharp ends of tools (such as screwdrivers or chisels) in a scabbard.
12. Report tripping hazards, faulty equipment, or any other unsafe conditions or practice.
13. Learn the location and use of different fire extinguishers, also the proper exit to reach the emergency station assigned you, and how to turn in an alarm.—*From employee booklet, "Let's Talk About Your Job," published by Maxwell House Coffee Div., General Foods Corp.*



Roller Truck Stays on Loading Dock

By constructing a roller truck designed to fully meet trailer-platform needs—but to be of little use elsewhere in the plant—Taylor Reed Co., Glenbrook, Conn., is always assured of having it on the loading platform.

In many food plants, powered lift trucks handle palletized cases to the loading platform and incoming loads from trailers into the plant. The fork truck is too heavy to enter the trailer, so a hand lift truck is usually used to move the cases to and from the inside of the trailer.

But since this same truck serves equally well for other jobs around the plant, it is often in use elsewhere when needed at the loading platform. Hence, the new roller truck was designed.

To make this truck, two sections of a discarded heavy roller conveyor were cut long enough to accommodate a pallet. These sections were then spaced about 6 in. apart and welded in place using angle irons at each end and center. The truck was made more rigid by welding angle iron between the rollers, V down (photo above shows how this was done).

The improvised truck is relatively light in weight and rolls readily inside a large truck or trailer. But being less convenient to move about the plant than a hand truck, it seldom strays from the loading dock.

This is Why the Nash is the Most Simple Compressor

It's the Nash!

There are no mechanical complications in a Nash Compressor. A single moving element, a round rotor, with shrouded blades, forming a series of buckets, revolves freely in an elliptical casing containing any low viscosity liquid. This liquid, carried with the rotor, follows the elliptical contour of the casing.

The moving liquid therefore recedes from the rotor buckets at the wide part of the ellipse, permitting the buckets to fill with gas from the stationary Inlet Ports. As the casing narrows, the liquid is forced back into the rotor buckets, compressing the gas, and delivering it through the fixed Outlet Ports.

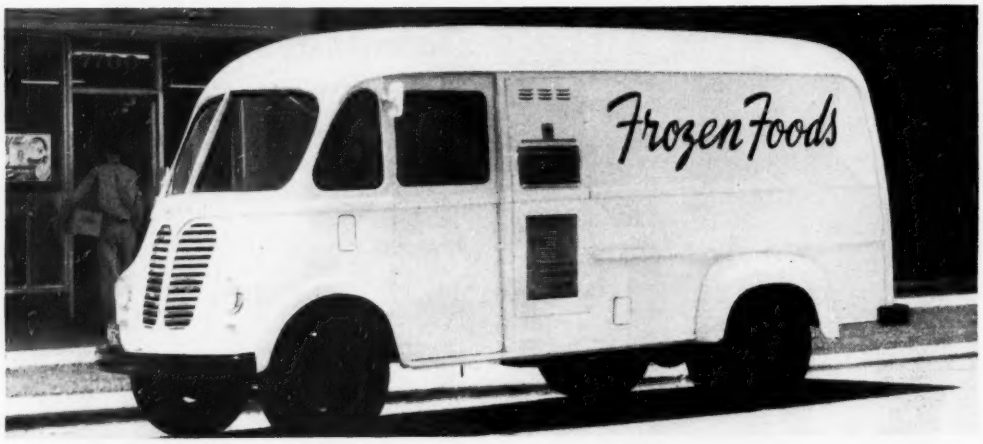
Nash Compressors produce 75 lbs. pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure. Since compression is secured by an entirely different principle, gas pumping problems difficult with ordinary pumps are often handled easily in a Nash.

Nash simplicity means low maintenance cost, with original pump performance constant over long periods. Data on these pumps sent immediately on request

- No internal wearing parts.
- No valves, pistons, or vanes.
- No internal lubrication.
- Low maintenance cost.
- Saves floor space.
- Desired delivery temperature automatically maintained.
- Slugs of liquid entering pump will do no harm.
- 75 pounds in a single stage.

NASH ENGINEERING COMPANY
31 WILSON, SO. NORWALK, CONN.

Food Equipment News



This new multi-stop delivery truck—

Has Built-In Refrigeration Unit

A

Factory-assembled refrigerated trucks are now on the market.

Two multi-stop delivery truck models, with automatically operated, constant-temperature refrigeration units, have been introduced. One has a range of 10 to 35 deg. F., the other from 35 to 50 F.

Any temperature in these ranges can be set by adjusting a control on the refrigeration unit. The low-temperature model is provided with 6-in. insulation; the medium-temperature type has 4-in. insulation.

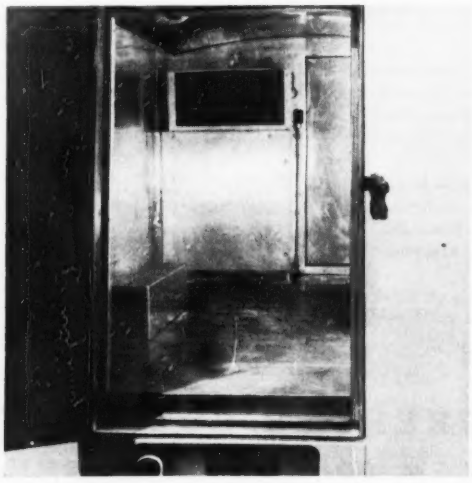
Approximately 256.4 cu. ft. of refrigerated space is available in the low-temperature model, while the medium range truck has 272.5 cu. ft. Access to the refrigerated space is provided by a 34-in. door at the rear and a 26-in. door at the front.

Interiors of the bodies are both air- and water-tight. All seams are overlapped, and joints are closed with a permanent sealer and securely fastened with metal screws.

New models are available with a choice of two refrigeration units: A gasoline engine drive unit, or a gasoline-electric drive unit. Both are essentially the same, except for inclusion of an electric motor in the latter for standby operation.

These same units are being made available for use in

Interior is both air- and water-tight . . .



. . . and is also accessible from front

other insulated trucks in the field. They are designed to refrigerate up to 400 cu. ft. of space.

Units are self-contained, automatic refrigeration packages. They contain a 4-cylinder, water-cooled gasoline engine; a 4-cylinder compressor with force-feed lubrication; a blower-type evaporator; and Freon refrigerant. The electric motor in the gasoline-electric drive unit is a 220-230v., single-phase a. c. motor.

Complete assembly, including controls, is mounted on an integral frame and can be installed or removed as a unit without any specialized knowledge. Only connections to trucks are to body, gasoline tank, and the electrical system.

Unit is installed behind the driver, in the left front corner of the truck. It occupies approximately 4 sq. ft.

Refrigerated model contains all of the features of the recently introduced standard trucks with Metro bodies, including greater interior space, easy service accessibility, increased visibility, improved chassis, and the new Silver Diamond 220-hp. truck engine. Truck has 12-ft. body and a gross vehicle weight of 10,000 lb.—*International Harvester Co., 180 N. Michigan Ave., Chicago 1.*

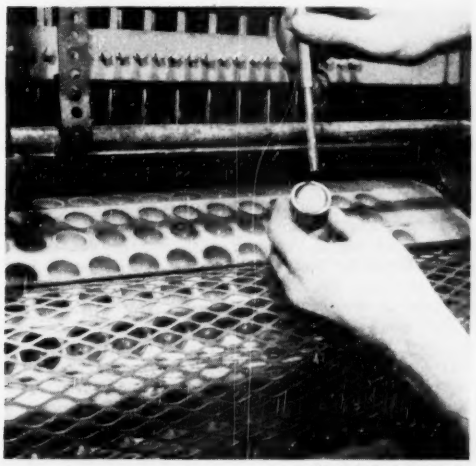


Photo by U. S. Rubber Co.

New Pitter Cuts Losses, Ups Quality A

This newly designed machine, using small rubber cups, is reported to pit cherries with a cleaner, smaller hole than any previous unit.

The rubber cups are stated to minimize losses due to crushing and tearing. And it is estimated that waste will be reduced from 18 down to but 9 percent of the total crop processed.

Should current tests of this equipment prove satisfactory, economic feasibility is seen for glass or can packing of fresh sweet cherries without the troublesome pit.

Pitting unit consists of a bank of needles and a rotating cylinder containing 700 cups. Cherries enter the machine on a conveyor belt and fall automatically into cups. Then the needles, operating at a rate of 120 cycles per min., punch out pits, forcing them through a small hole in the bottom of each cup. Pitless cherries remain in the cups.

The rubber cushions the shock which would otherwise tear the cherries. As the cylinder rotates, the fruit passes on to another conveyor belt for sorting and further processing, while the pits are carried way in a stream of water.

Want More Information?

It's free—and easy to get. Say for example, you want added details on the item marked "B" here on page 93. Simply flip to one of the special Reader Service postcards inside the front cover and circle 93B. Sign at the bottom and mail—no stamp needed. Then the extra information will be on its way to you.

Pitting capacity is 1,000 lb. per hr. Maker states machine presents a better looking, more salable cherry, also that cups impart neither taste nor odor to the cherries. Since the cups are interchangeable, they also make it possible to pit several different sizes of cherries on the same machine.

Units are available on a lease basis.—*Dunkley Co., Kalamazoo, Mich.*

Conveyor Is Portable and Flexible B

The problem of conveying your products around corners is readily solved by this adjustable, flexible roller conveyor.

Known as the "Flexco" roller conveyor, it is also portable and can be easily moved from one location to another.

Made in 12-, 18-, 24-, and 36-in. widths, the units can be installed in any combination of radii for varying turns—45 deg., 90 deg., or 180 deg., as required.—*Berlin Chapman Co., Berlin, Wis.*

DON'T MISS THESE . . .

New splashproof sanitary motor has special screens over end vents to prevent intrusion of water. Page 94

Unit packs meat in valve-type multi-wall paper bags having polyethylene-coated inner ply. Page 96

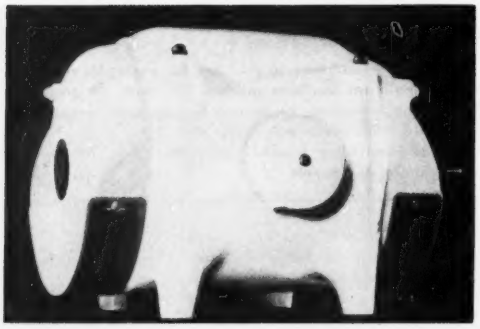
Materials pipe-conveyed in batches by system employing air as propellant. Page 96

New electric truck for faster lifts uses a separate motor for the hydraulic pump. Page 98

AND WATCH FOR . . .

Compact cherry stemmer, requires very little space, has high efficiency and capacity. November FI

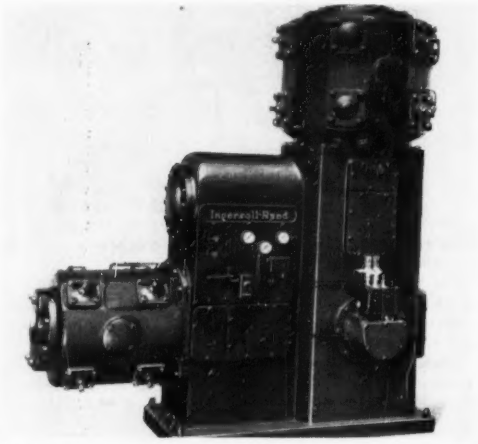
Pushbutton control system permits repetitive deliveries of liquids. November FI



New Splashproof Sanitary Motor A

To meet all sanitation codes, a new screened, splashproof sanitary motor has been developed.

Designated as Type CP, it is equipped with screened ends, with the openings located underneath so that water cannot intrude. Use of vents permits full ventilation. Motor is fully streamlined. It is finished in baked white enamel. Sizes range from 3 to 7½ hp.—*U. S. Electrical Motors Inc., 200 East Slauson Ave., Los Angeles 54.*



Air Compressor Has "New Look" B

Simplicity of design, operation, and maintenance, as well as operating economy and compactness, are stressed in a new line of heavy-duty electric-driven air compressors.

Sizes range from 125 to 350 hp. for continuous full load service and two-stage compression to 80-125 psi. discharge pressures.

Designated as the XLE, this completely new "L" design embodies a single vertical low-pressure compressor cylinder, a horizontal high-pressure cylinder, and synchronous motor mounted directly on the crankshaft. The unit requires only a very small foundation.

One innovation is "pipeless through-frame air flow." Air enters and leaves the compressor through main air connections on the frame, instead of on cylinders, and is led to and from both cylinders and intercooler through large passages within the frame itself. There is no interstage piping nor cylinder strain due to air piping.

The intercooler is of a packaged design requiring less space. It fits entirely within the same frame. As a result, the compressor becomes a stream-lined, sturdy, and well-ribbed structure that makes the unit radically different in appearance, extra strong, and easy to install and keep clean.

Counterflow, tube-and-fin construction of the intercooler is stated to give excellent cooling with very little pressure loss. Unit requires only a small quantity of water. It is made of copper alloy throughout.—*Ingersoll-Rand Co.,* 11 *Broadway, New York City* 4.

Mesh Containers Come Back Flat C

With sides folded down, these Palletainers occupy only a little more return shipping space than the height of the pallet base.

Designed and constructed to carry loads up to 4,000 lb., the containers are made of welded steel wire with steel pallet base and legs for fork truck handling. They are described as rugged, fireproof, rust-resistant, and easy to clean. Since dirt and foreign matter is not retained by these containers but drops through the mesh, cleanliness is promoted in warehousing with these units.

They can be stacked high in storage because they interlock, yet they are easily moved with fork or lift truck. Their eight-way pallet-base entry permits easy maneuverability in shipping and storage areas.—*Union Steel Products Co., Albion, Mich.*

Handles Corrosive Liquids Safely D

This new pump with air line pressure is reported to offer a safer, more economical, and faster way to remove acids and other corrosive liquids from stainless-steel containers. Maker says liquids flow smoothly, stop instantly, and come in contact only with corrosion resistant tube.—*General Scientific Equipment Co., 2700 W. Huntington St., Philadelphia.*

PATAPAR

is custom-tailored to fit your needs...

Need a paper that's strong when wet? Patapar Vegetable Parchment gives it to you. Want a paper that resists grease? Patapar is your answer. Want package sales appeal? A colorfully printed Patapar wrapper really sparkles.

Patapar is produced in 179 types. Each type is "custom-tailored" to meet special needs. Types vary as to wet-strength, grease-proofness, opaqueness, moisture vapor resistance, pliability, thickness and many other qualities.

Tell us your requirements. We will recommend the type of Patapar best suited to meet them.

BEST PAPER FOR:

Butter wrappers
Ham boiler liners
Deep freeze wraps
Can liners • Fish wrappers
Cheese wrappers
Margarine wrappers
Milk and cream can gaskets
Bacon wrappers
Vegetable wraps
and many other uses

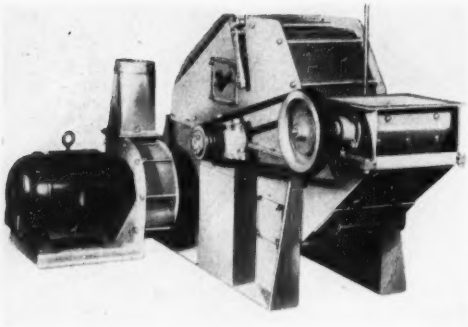
Patapar is furnished plain or beautifully printed in one or more colors

Patapar
HI-WET-STRENGTH
GREASE-RESISTING PARCHMENT

Protected by Patapar Vegetable Parchment

Patapar Keymark, nationally advertised symbol of wrapper protection

PATERSON PARCHMENT PAPER COMPANY • BRISTOL, PENNSYLVANIA
Headquarters for Vegetable Parchment since 1885
West Coast Plant: 340 Bryant Street, San Francisco 7, California
Sales Offices: 122 E. 42nd Street, New York 17, N. Y. • 111 W. Washington St., Chicago 2, Ill.

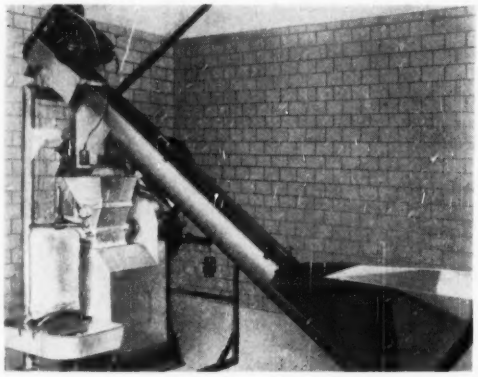


Mill Uses Heavy Rotor Assembly A

Sturdily built and well balanced, a new hammer mill equipped with a heavy rotor assembly and precision roller bearings has been announced.

Total power input ranges from 55 to 90 hp., including 15 hp. on the direct-driven exhauster. Speed is 1,750 rpm, which is relatively slow for a hammer mill.

Built-in components include a magnetic separator of the hinged chute type and a 16 in. wide crusher feeder with remote control. Screens can be readily changed from the floor above without stopping the mill.—*The Bauer Bros. Co., 1740 Sheridan Ave., Springfield, Ohio.*



Packs Meat In Valve-Type Bags B

Edible meat trimmings are now being packed in multiwall paper valve bags by a specially designed automatic filling machine.

Bags have a polyethylene-coated inner ply to accommodate the trimmings. The packing unit is known as the 400-S.

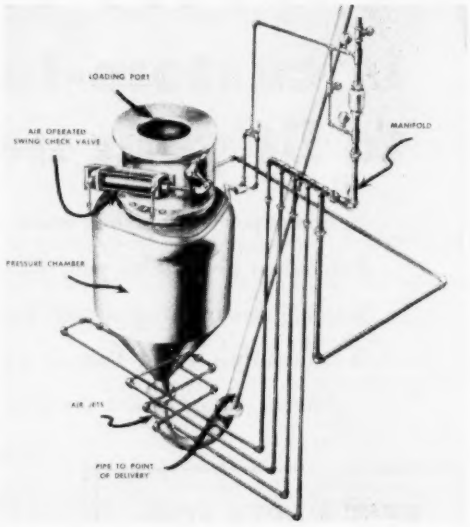
More than two years experimentation at Oscar Mayer & Co., Madison, Wis., were devoted to this adaption of the packaging system for the meat industry. Commercial packaging, using the new one-man operated packer, reportedly has been averaging about 100 75-lb. bags per hour.

Sanitary factors were given prime consideration in the design. Stainless steel parts of the packer, feeder, hoppers and conveyor system which came in contact with meat trimmings aim to prevent retention of odors and insure against contamination by foreign particles. Stainless steel also facilitates steam cleaning of the equipment.

The unit is a simultaneous filling and weighing packer. An inclined screw feeder provided with an intake supply hopper conveys the product to the packer machine hopper. Intake feeder hopper receives meat trimmings from a conveyor which is part of the plant's trimming line. Packer itself is mounted on a platform scale, and when the desired weight of the bag is reached, the feeder automatically stops, halting flow of the product.

It is stated that no scoring or tearing of the meat have been noted in the operations.

Maker's continuous tests on storage of meats in multiwall bags were conducted at zero temperature for periods of from 30 to 190 days, and reportedly no freezer burn was indicated, the meat retained good color and flavor, and there was no rancidity. Further, the bags retained their flexibility.—*St. Regis Paper Co, 230 Park Ave., New York City 17, N. Y.*



Materials Pipe-Conveyed by Air C

In a new pipe line conveyor, granular, crushed or pulverized material is moved in batches by air—from receiving to storage and from storage to point of use.

Known as the "Turbo-Drive," it has an entrance or swing check valve through which the material to be transported is loaded into the pressure chamber. Air pressure is controlled by a manifold incorporating several valves and a pressure regulator. Also included are the pipe, bends, switches and fittings necessary for delivering the material to point of use.

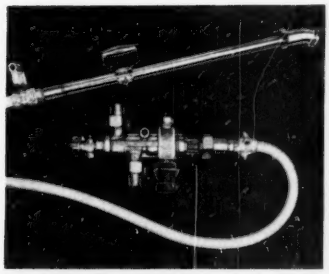
Each batch is delivered complete, thus there is no contamination between successive batches when moving different materials. Being enclosed in a steel pipe, materials are kept clean and dust conditions are eliminated. A ton or more of material can be moved in a few minutes.

Entire system is controlled by a single operator located at the storage or mixing source. Dispatch to more than one location is made possible through the use of a transfer switch. Conveyor is available in three sizes—7, 15, and 30 cu. ft. capacities.

Amount of air pressure required for operation depends upon the material, size of batch, and distance to be moved.—*Crane Co., 836 So. Michigan Ave., Chicago 5.*

Quick-Clean Pan A

This coating pan has a new stand which is totally enclosed so that bearings, drive mechanism, and all moving parts are fully protected from dust and dirt. Thus, cleaning takes only fraction of time usually required.—*F. J. Stokes Machine Co., 5900 Taber Rd., Philadelphia 20.*



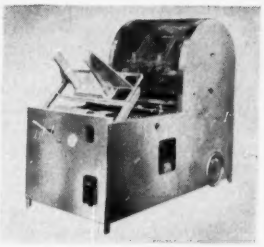
Compact Jet Cleaner Does Thorough Job B

Quick cleaning of processing, and packing machinery, as well as of walls, floors, and the like, is provided by a new Hi-Pressure jet-cleaner.

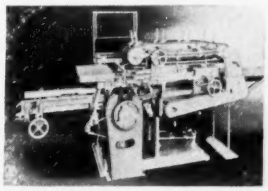
Known as Model "B", it is small and compact for wall mounting or postings. Cleaner provides a high-temperature, large-volume water jet at pressures adjustable up to double the plant steam pressure. Combined effect of high temperature, large volume and hydraulic force is stated to easily wash away slime, mold growths, fondant, grease and other matter.

Jet consists of a venturi-injector mixing chamber which is readily connected to a steam and cold water line, a 50 ft. length of high pressure hose, cleaning lance and special nozzle. A connection and control valve is provided for automatic addition of a detergent, if desired, in any proportion from 0 to 10 percent.—*Sellers Injector Corp., 1633 Hamilton St., Philadelphia, 30.*

NEW PACKAGE MAKES SALES JUMP



The cartons are made on our Palmer Carton Former



The cartons are wrapped individually on our Model FA and bundled in groups of 4 on our Model FA-2 machine.

The new Puritan marshmallow package, consisting of four quarter-pound units individually wrapped, has given the Shotwell Manufacturing Company a "freshness" theme in merchandising that is greatly increasing sales. Here again "PACKAGE" had the machines to do the complete job. . . . The cartons are economically made at high speed on our Palmer Carton Former. . . . They are individually wrapped on our well-known Model FA. . . . And are bundled in groups of four on our FA-2 machine.

Big advantage of this type of package is that it insures perfect enjoyment of the marshmallows because the individually wrapped packages keep them fresh until all used up.

This same idea is also being applied to crackers, and here, too, "PACKAGE" has supplied the most advanced of wrapping equipment. Our Model FA, with the new automatic cracker feeder designed especially for wrapping crackers not only counts out the correct number for a quarter-pound unit, but rejects any broken crackers. Its new flexible folding and sealing mechanism prevents breakage in the wrapping process, making large savings for biscuit manufacturers.

"PACKAGE" has the experience and the machines to meet modern packaging needs!

NEW YORK CHICAGO BOSTON CLEVELAND
ATLANTA DALLAS DENVER LOS ANGELES
SAN FRANCISCO SEATTLE TORONTO MEXICO, D. F.

PACKAGE MACHINERY COMPANY
SPRINGFIELD MASSACHUSETTS

Gigantic Underground Storage Uses

FRICK Refrigeration

Originally a limestone quarry, the Natural Cooler Storage of the U. S. Dept. of Agriculture near Atchison, Kansas, is one of the largest refrigerated warehouses in the world, having capacity for 3,000 carloads. A temperature of 32 degrees F. is held in the great cave by two Frick 4-cylinder compressors, driven by motors totaling 600 horsepower.

The Loading Platforms and Entrance to the Cave

Overhead Brine Lines Lead to Air Cooling Units

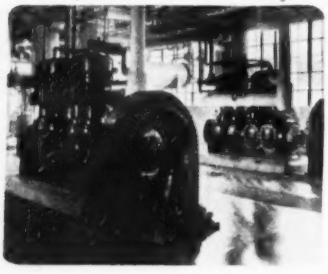
For that important cooling job of yours, specify Frick air conditioning, refrigerating, ice-making or quick-freezing equipment.

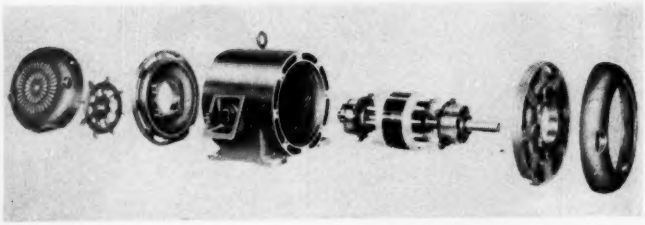
Get quotations now: write, wire, phone or visit

FRICK CO. DEPENDABLE REFRIGERATION SINCE 1882 WAYNESBORO, PENNA. U.S.A.

Also Builders of Power Farming and Sawmill Machinery

Frick Compressors with Motors Totaling 600 Horsepower at Natural Cooler Storage





Totally Enclosed Motor Has Cast-Iron Frame A

A new model fan cooled motor, on cast-iron frame and totally enclosed, is announced in a line offering ratings from 5 through 250 hp. in both standard (Type EP) and explosion-proof (Type JP) designs.

The motors are termed especially suitable for applications in plants where there is a problem of corrosion, either because of the nature of the materials processed or because the motors must be installed outdoors.

Construction details include: (1) Rugged inner and outer frame and feet, cast in one piece; (2) ribbed cast-iron end plates to add extra strength; and (3) one piece, easily removable blower shield, with integrally formed air intake. Blowers used on Type EP motors are of malleable iron, those used on Type JP are of non-sparking bronze. On all except the largest ratings, the blower design permits operation of the motors in either direction of rotation.

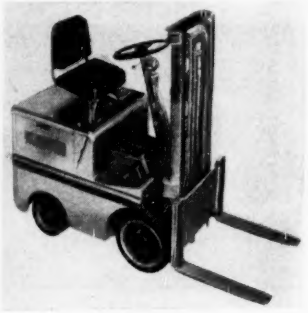
The two piece, diagonally split conduit box is screwed onto a threaded nipple brazed to the stator frame to allow maximum room for easy connection of the motor to the line.

Other details: Sealed leads, cartridge-type ball bearings and special varnish treatment on the windings and cast aluminum rotors.—*Wagner Electric Corp., 6400 Plymouth Avenue, St. Louis 14.*

Conveyor Stand Allows Variations in Height B

This power belt conveyor is mounted on a new caster-equipped, adjustable height, U-base stand. Base is made in four standard sizes for 8, 10, 12, and 16-in. belt width carriers of company's line.

The new accessory has four free-swiveling casters (user may choose wheel types and sizes). Conveyor drive end height is adjusted by a telescoping device, and there is a toggle stand designed to provide safe, positive adjustment of the delivery end of the unit. If desired, base can be furnished with floor locks to hold conveyor securely in place.—*The Rapids-Standard Co., Inc., 342 Republic Bldg., Grand Rapids 2, Mich.*



New Electric Trucks For Faster Lifts C

Use of a separate motor for the hydraulic pump features a new electric battery-powered "Truckloader," 1,000-lb. fork-lift truck.

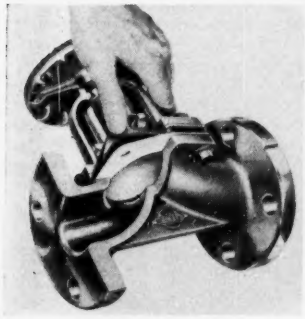
Lifting and tilting speeds are reported as 80 percent over the former model. Lift control lever, positively identified, operates in same direction as action desired. Operator pulls straight up to raise forks, pushes down to lower them.

Uprights are of rolled alloy steel for added strength to lift assembly. Lift heights are available in a range from standard 84 in. with overall of 61 in., to 120 in. and an overall of 84 in.

Steering mechanism is new, with the pivoted type, no-kickback steering axle.

Other standard features are automatically accelerated control (non-plugging type), and a "dead man" brake operated off the drive shaft of the motor. This brake sets automatically

whenever the driver's seat is vacated. Increased load capacity is reported, with 24-in. load-center rating, and also 30 percent higher speed.—*Clark Equipment Co., Battle Creek, Mich.*



Inert Plastic Employed For Valve Diaphragm A

Following successful field tests, a new chemically inert diaphragm is announced for Grinnell-Saunders valves.

The thermo-plastic, "KEL-F" has been molded to form a tough and flexible valve diaphragm to withstand such hard-to-handle materials as chlorinated aliphatic and aromatic compounds, concentrated nitric, chromic, hydrofluoric and sulphuric acids, and most solvents which readily attack rubber and synthetic materials.

New diaphragms are available only for valves altered to use the special backing sheet employed to cushion

Minimize Foaming B

These free-flow reducers provide tapered path from large to small lines with minimum of the agitation and friction that cause turbulence and foaming. Lines are easily cleaned—have no pockets to collect sediment. Reducers are available in both concentric and eccentric types (photo) in standard sizes from 1- through 4-in.—*Tri-Clover Machine Co., Kenosha, Wis.*

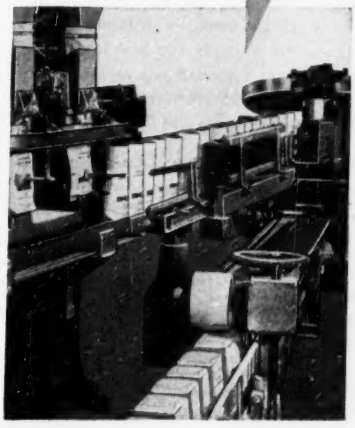
THE BEMIS DELTASEAL BAG

PLUS

DELTASEAL PACKAGING EQUIPMENT

Equals

The Most Economical, Efficient Package for Your Product



- Deltaseal® filling and closing is fast . . . mostly automatic . . . less handling.
- Deltaseal Bags have a neat, square, full-pack appearance . . . build easily into eye-catching displays.
- Crisp, brilliant Bemis printing on Deltaseals headlines your brand.
- Consumers like Deltaseal's exclusive Pull-Cut-Pour Spout.
- Bemis Packaging Specialists help you get the smoothest, most economical service from your Deltaseal System.

Ask the Bemis man for the complete Deltaseal story.

Baltimore • Boise • Boston • Brooklyn • Buffalo • Chicago • Denver Charlotte • Cleveland • Detroit • East Pepperell • Indianapolis Houston • Jacksonville, Fla. • Kansas City • Los Angeles • Memphis Louisville • Minneapolis • Mobile • New Orleans • New York City Norfolk • Oklahoma City • Omaha • Peoria • Phoenix • St. Louis Pittsburgh • Salina • Salt Lake City • San Francisco • Seattle Vancouver, Wash. • Wichita • Wilmington, Calif

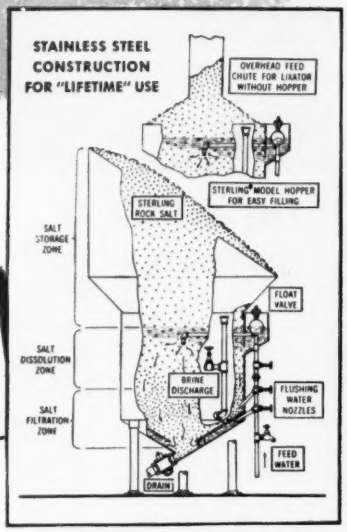
Bemis

"America's No. 1 Bag Maker"

BRINE! EXACTLY RIGHT WITHOUT MEASURING or STIRRING

JUST TURN IT ON!

STERLING ROCK SALT
BRINE DELIVERED BY PIPE TO EVERY POINT IN YOUR PLANT
• FLAVORING • WASHING • SOAKING
• BLANCHING • GRADING • BRINE PEELING
• ZEOLITE WATER SOFTENERS • PICKLING



HOW LIXATOR WORKS

In the dissolution zone—flowing through a bed of Sterling Rock Salt which is continuously replenished by gravity feed, water dissolves salt to form 100% saturated brine. **In the filtration zone**—through use of the **self-filtration** principle **originated by International,** the saturated brine is thoroughly filtered through a bed of undissolved rock salt. The rock salt itself filters the brine. Nothing else is needed.

WHAT THE LIXATOR PROVIDES

- ✓ **Chemical and bacterial purity to meet the most exacting standards for brine.**
- ✓ **Unvarying salt content of 2.65 pounds per gallon of brine.**
- ✓ **Crystal-clear brine.**
- ✓ **Continuous supply of brine.**
- ✓ **Automatic salt and water feed to Lixator.**
- ✓ **Inexpensive, rapid distribution of brine to points of use by pump and piping.**

Savings up to 20% and often more in the cost and handling of salt have been reported by many Lixate users. Why not investigate?

• Say good-by to "guesswork" and bother! You can eliminate shoveling, hauling, and laborious hand stirring of salt and water—with International's Lixate Process for Making Brine. Assures accurate salt measurement every time. Stops waste through spilling. Saves time and labor.

• The Lixator *automatically* produces 100% saturated, free-flowing, crystal-clear brine which may be piped to as many points in your plant as you wish—any distance away—by gravity or pump. YOU SIMPLY TURN A VALVE to get self-filtered LIXATE Brine that meets the most exacting chemical and bacterial standards.

An INTERNATIONAL Exclusive

The **LIXATE*** *Process*

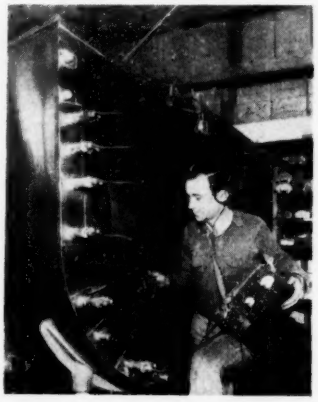
FOR MAKING BRINE

*REG. U. S. PAT. OFF.

INTERNATIONAL SALT COMPANY, INC., Scranton, Pa.

and protect the thermo-plastic for long service life.

Valve bodies may be cast of corrosion resistant alloys or can be lined with glass, lead, rubber, or other impervious linings to suit the operating conditions. Service conditions for the new units include pressures up to 100 psi. Temperatures vary according to the material and pressure in the pipe line, with a tentative maximum temperature recommendation of 225 deg. F. at the lower pressures. New diaphragms are not for use under continuous vacuum conditions.—*Grinnell Co., Inc., Providence, R. I.*



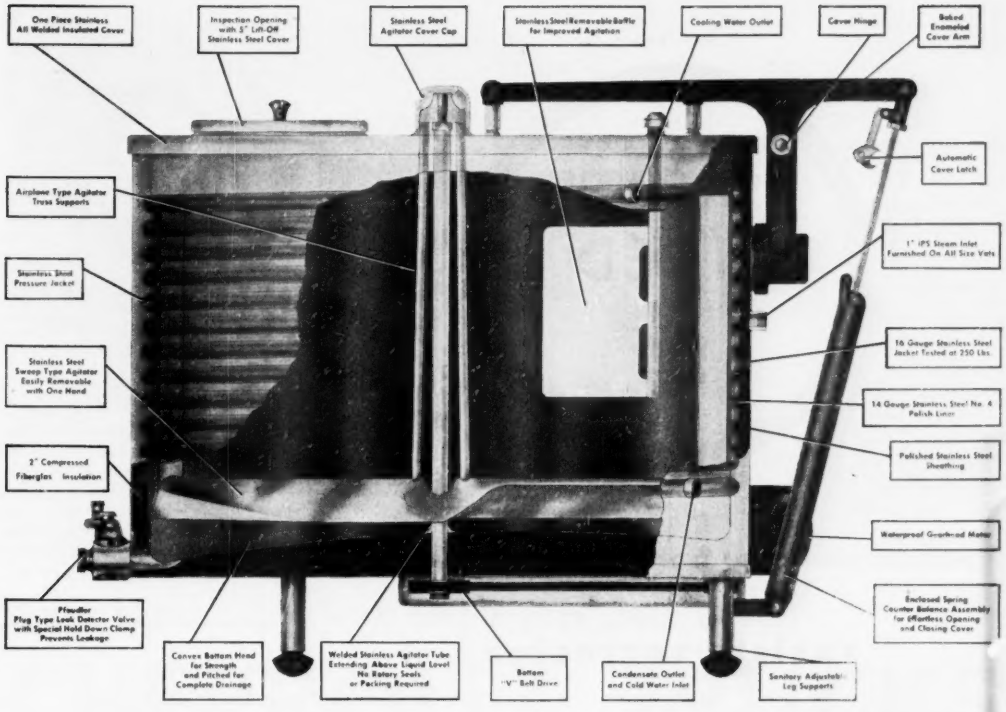
Leaks Detected Quickly By Portable Unit

Food equipment leaks can now be detected quickly and with greater accuracy by means of a portable unit.

In the modern dairy, procedure dictates the use of large, sanitary, refrigerated storage facilities to keep milk fresh and pure until ready for processing. Refrigerating tanks must be tested to make certain that all welds are airtight so that refrigerant does not escape. If a leakage occurred while in use, the entire contents of the tank would be spoiled.

By introducing a small amount of carbon tetrachloride into the refrigerating system, leaks can be quickly and easily located. The barrel of a hand-held "gun" is passed along the weld. When a leak is detected, an indication on a control unit to which the gun is connected shows instantly that the weld is leaky.

The control unit operates from 115v. ac., 60 cycles. It is light and compact enough to be carried by an attached handle, or it may be slung on the shoulder with a strap. Headphones can be used in conjunction with the unit to give audible indication of a leak.—*General Electric, Schenectady 5, N. Y.*


One Piece Stainless All Welded Insulated Cover
Inspection Opening with 5" Lift-Off Stainless Steel Cover
Stainless Steel Agitator Cover Cap
Stainless Steel Removable Baffle for Improved Agitation
Cooling Water Outlet
Cover Hinge
Baked Enameled Cover Arm
Automatic Cover Latch
1" IPS Steam Inlet Furnished On All Size Vats
16 Gauge Stainless Steel Jacket Tested at 250 Lbs.
14 Gauge Stainless Steel No. 4 Polish Liner
Polished Stainless Steel Sheathing
Waterproof Gearhead Motor
Enclosed Spring Counter Balance Assembly for Effortless Opening and Closing Cover
Sanitary Adjustable Leg Supports
Airplane Type Agitator Truss Supports
Stainless Steel Pressure Jacket
Stainless Steel Sweep Type Agitator Easily Removable with One Hand
2" Compressed Fiberglas Insulation
Pfaudler Plug Type Leak Detector Valve with Special Hold Down Clamp Prevents Leakage
Convex Bottom Head for Strength and Pitched for Complete Drainage
Welded Stainless Agitator Tube Extending Above Liquid Level No Rotary Seals or Packing Required
Bottom "V" Belt Drive
Condensate Outlet and Cold Water Inlet

Announcing The New PFAUDLER PRESSURE PROCESS LO-VAT

The new Pfaudler stainless steel Pressure Process Lo-Vat provides fast heating, mixing and cooling of all fluid products of high or low viscosity. It may be used with any heating or cooling medium. Operation and cleaning are amazingly simplified, sanitation greatly improved.

To give you such advantages, Pfaudler engineers designed a new special stainless steel spiral jacket (tested at 250 psi) which incorporates a highly efficient multiple jet manifold to permit heating with either live steam or hot water. Circulating controls and pump are eliminated. Rapid cooling is assured by the spiral jacket which accelerates the movement of the coolant and provides full contact with the entire cooling area.

Heating and cooling results are further accelerated by thorough product agitation. A new anchor type stainless agitator with baffle thoroughly but gently mixes the product. It prevents overheating and film build-up in cooling. Powered by a bottom motor drive, the new agitator simplifies operation and cleaning. It can be removed as easily as a household washing machine impeller. Capacities: 100, 200 and 300 gallons. All vats are 42" from floor to cover, making them easily accessible for cleaning. See your Pfaudler Dairy Equipment Distributor or write for Bulletin 871.

NEW FEATURES GIVE YOU

- **GREATER VERSATILITY**
- **IMPROVED SANITATION**
- **EASIER OPERATION**

Pfaudler

THE PFAUDLER CO., ROCHESTER 3, NEW YORK
Engineers and Fabricators of Food Processing Equipment

GLASS-LINED STEEL
Hastelloy—Aluminum
Tantalum—Carbon Steel
Solid or Clad Stainless Steel
Nickel, Inconel, Monel

THE PFAUDLER CO., Dept. FI-10, Rochester 3, N. Y.

Please send me a copy of the new Pressure Process Lo-Vat Bulletin 871.

Name_____

Company_____

Address_____

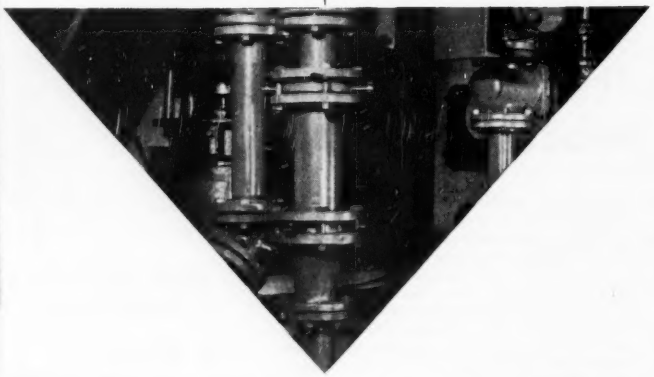
City_____ State_____

SARAN LINED

steel pipe

available immediately ✳ readily field fabricated

resists corrosion



Saran's unusual resistance to most corrosive chemicals and solvents plays an important part in the reduction of shutdowns and lost production! Saves time and labor!

Saran lined steel pipe is available in maximum lengths of 10 feet and in sizes from 1 to 6 inches inclusive. Also available are saran lined plug valves, Saunders type diaphragm valves, flanges, reducing flanges, flanged fittings, gaskets and fittings with union ends.

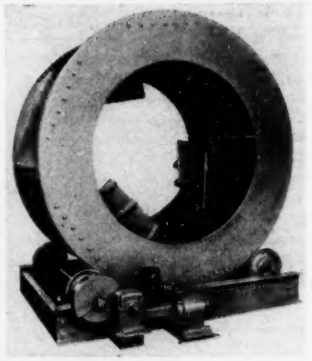
Write us today for further information concerning saran lined steel pipe and how it may help solve your production problems. Manufactured by The Dow Chemical Company, Bay City, Michigan, distributed nationally by Saran Lined Pipe Company, Dept. TSP-58.

Saran Lined Pipe Company

2415 BURDETTE AVENUE • FERNDALE 20, MICHIGAN

Offices in: New York • Boston • Philadelphia • Pittsburgh Chicago • Tulsa • Indianapolis • Houston • San Francisco Los Angeles • Portland • Cleveland • Denver • Seattle Charleston, S. C. • Toronto

another DOW product



Tests Loaded Cartons A

How well your loaded paperboard, fiberboard, and wooden shipping cartons will withstand various handling and shipping stresses can be determined in this fatigue tester. Machine is built in two models, one for shock-testing small-medium containers, other for medium-large. *L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City 7, N. J.*

Equipment Briefs

Improved Research Microscopes B

Every model of a new series of research microscopes has an inclined binocular body that can be interchanged with a graduated monocular draw tube for photomicrography, measuring, micro-projection, and other research applications. Draw tube is adjustable and graduated from 146 to 172 mm. in length. The new instruments, Series "E", are reported by the maker to have the lowest fine-adjustment control of any microscope available.—*Bausch & Lomb Optical Co., 685 St. Paul St., Rochester, N. Y.*

Odorless Paint Is Fast Drying C

Danger of food tainting during painting operations is stated to be eliminated through use of Dampcoat white enamel. It can be applied where damp surfaces prevail, such as in dairies and canning plants. Maker says it can be applied with either brush or spray and dries in 3 hr. Ink, pencil marks, wax crayons, and many other stains are said to wash right off.—*The Wilbur & Williams Co., Greenleaf & Leon Sts., Boston 15.*

Keeps Labels Smudge-Proof D

Identification once written on a new pressure-sensitive tape is reported free from smudging or erasure. Made of two sheets of acetate tape with a special sensitive carbon material between, it is stated to be oil-proof, water-proof, acid-resistant, and to withstand heat up to 150 deg. F.—*Labelon Tape Co., 100 Anderson Ave., Rochester, N. Y.*

More Fire Hose in Less Space E

"Blazeguard", a flatter-folding, cotton, rubber-lined fire hose, single and double jacket, is designed to occupy approximately 30 percent less space on wall or fire truck rack than old type fire hose. Also featured is increase in tensile strength and durability.—*Approved Equipment Mfg. Co., Inc., 330 Main St., New Milford, N. J.*

—*End*

Get a better day's work out of your Truck Dollar

CHEVROLET TRUCKS

CHEVROLET

You invest money in a truck to *get work done.* And you can prove to your own satisfaction that a Chevrolet truck does more work for every dollar you put into it.

You get *more for your money* right from the start, because your Chevrolet truck is priced at rock bottom. Chevrolet volume production—far and away the biggest in the truck field—makes possible extra features and extra engineering advantages at lowest cost.

You get *more for your money* every driving mile, because Chevrolet trucks are economical to operate. The top-rated efficiency of Chevrolet Valve-in-Head engine design saves money on gas and oil day in, day out.

You get *more for your money* right through the years, because your Chevrolet truck cuts upkeep to the bone. Hypoid rear axles, diaphragm spring clutch, ball-type steering and many other great truck features help keep your truck on the job and out of the shop.

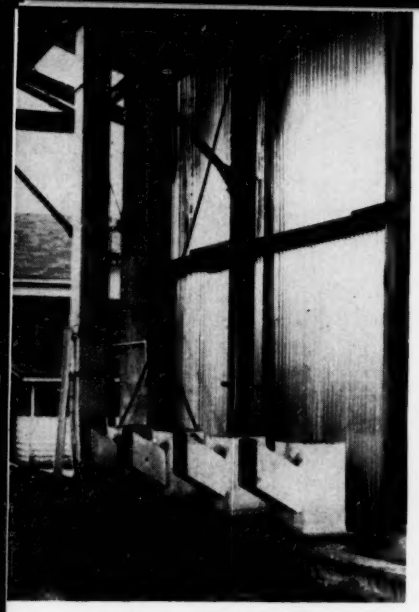
Get the full "more-work-per-dollar" story from your Chevrolet dealer—and get America's biggest selling, best performing truck: Chevrolet.

CHEVROLET MOTOR DIVISION, *General Motors Corporation*
DETROIT 2, MICHIGAN

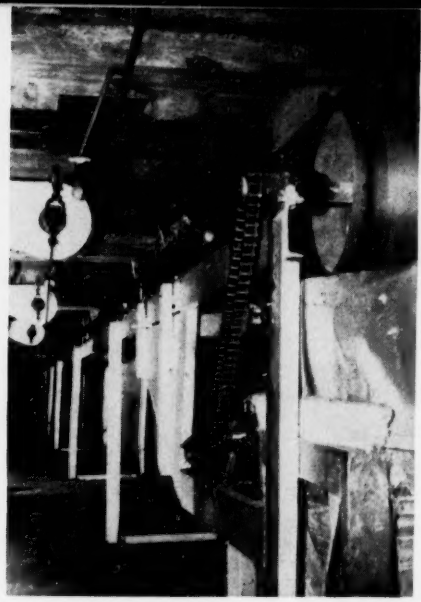
These Great Features Help Tell Why
CHEVROLET TRUCKS
ARE THE FIRST CHOICE OF
TRUCK BUYERS EVERYWHERE

TWO GREAT VALVE-IN-HEAD ENGINES: the new Loadmaster and the improved Thriftmaster—to give you greater power per gallon, lower cost per load • THE NEW POWER-JET CARBURETOR: smoother, quicker acceleration response • DIAPHRAGM SPRING CLUTCH for easy-action engagement • SYNCHRO-MESH TRANSMISSIONS for fast, smooth shifting • HYPOID REAR AXLES—5 times more durable than spiral bevel type • DOUBLE-ARTICULATED BRAKES—for complete driver control • WIDE-BASE WHEELS for increased tire mileage • ADVANCE-DESIGN STYLING with the "Cab that Breathes" • BALL-TYPE STEERING for easier handling • UNIT-DESIGN BODIES—precision built.

TURN PAGE FOR FOLDOUT FLOWSHEET →



1 **BUCKET ELEVATOR** (background) hoists the peanuts to silos.



2 **CONTINUOUS** belt conveyor beneath silos carries nuts to elevator in processing plant.

UNFOLD HERE

Modern Peanut Butter Processing

Automatic Equipment, Scales, and Controls Up Efficiency and Quality

CONTINUOUS materials flow with a running in-plant inventory marks the peanut butter processing operations of Cinderella Foods, Dawson, Ga., graphically illustrated in the accompanying pictures and foldout flowsheet.

Shelled nuts are received in tractor-drawn carts, weighed, dumped into a bucket elevator, and hoisted to a conveyor belt running above a battery of four huge silos.

Then, as required, nuts are dropped to a belt beneath the silos and carried to a bucket elevator which raises them to a storage bin in the processing building. From here, they are weighed in a batch scale, then travel over a vibrating screen for removal of any debris before going to the roasters. Variables in roasting (time and temperature) are instrument controlled.

Hoppers above the roasters—Point (4) in the diagram—are equipped with level controls to provide each roaster with a uniform charge. After roasting, the nuts drop to coolers. These units have false bottoms of perforated metal. Cool air is drawn through the nuts by suction blowers. Cooled nuts then go to the roasted-peanut storage bin.

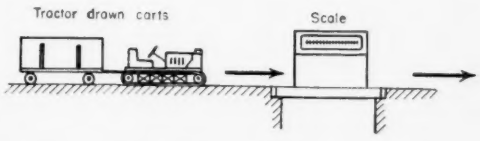
From here they are drawn as needed and passed to blanchers for removal of skins. Nuts next go by a bucket elevator to a hopper feeding a battery of mills. Stainless steel electric vibrating dispensers are employed to add salt—Point (7)—in a uniform quantity to the ground nuts leaving the mills. Hydrogenated oil is added to the butter after it leaves the mills and before it goes to the homogenizers. Proportioning pumps are used to add the oil.

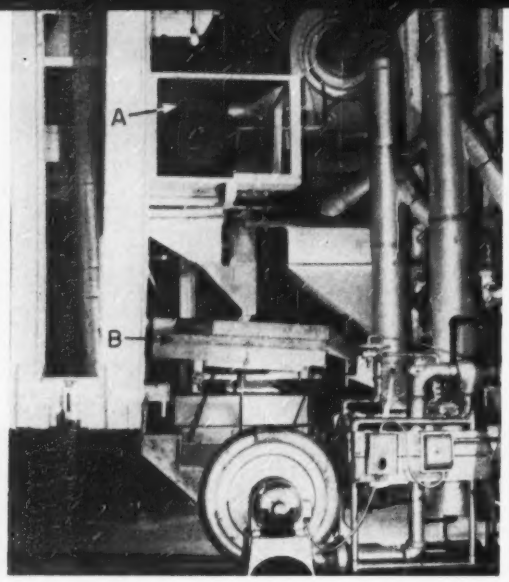
Homogenized peanut butter then passes to a filler, where the product is put up in glass jars and sealed under vacuum —Point (9). Jars are then cased and conveyed to storage. Portable stackers are used in storing the cases and also in the loading of truck trailers for shipment.

Corrosion-resistant metal is used throughout for all equipment-product contact surfaces.

Specially Striking, Too . . .
is Cinderella's fool-proof, continuous inventory system that automatically keeps tab on all peanut-butter processing materials. Read all about it in "Scales Point Quick Finger at Losses," page 56.

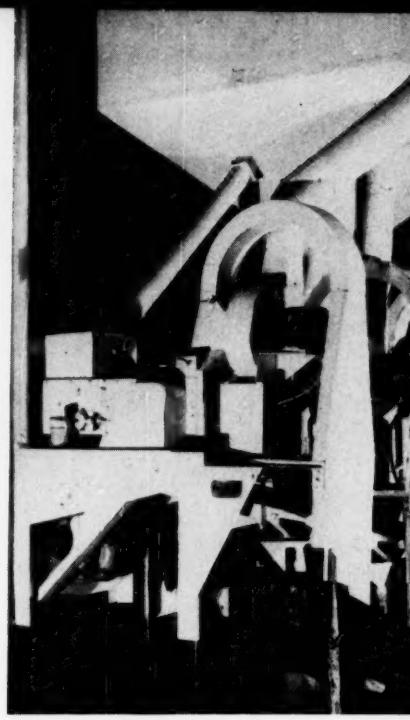
F I PICTURE - FLOWSHEET NO. 22





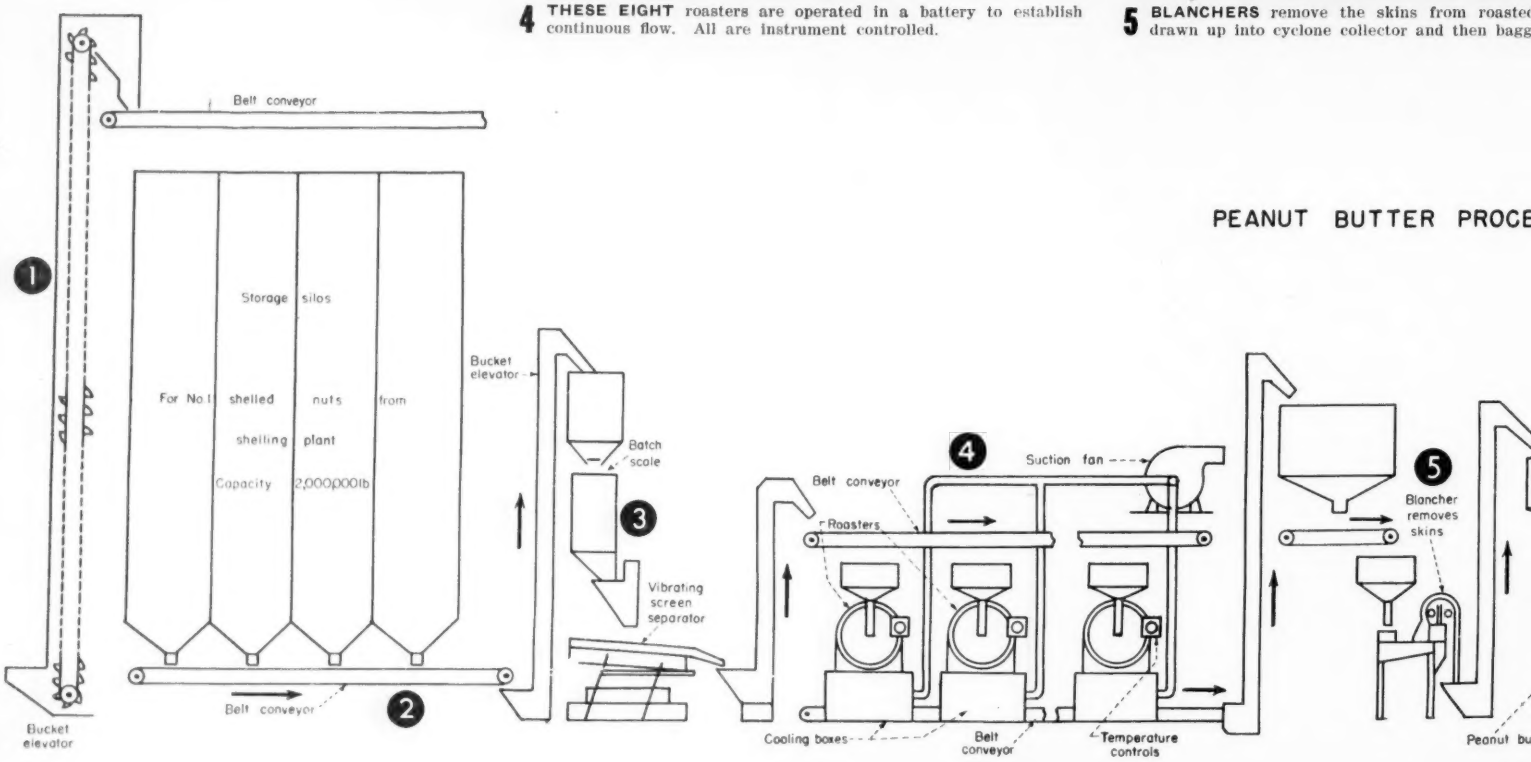
3 **BATCH SCALE** (A) weighs nuts going into process. Vibrating screen (B) removes foreign materials.

4 **THESE EIGHT** roasters are operated in a battery to establish continuous flow. All are instrument controlled.

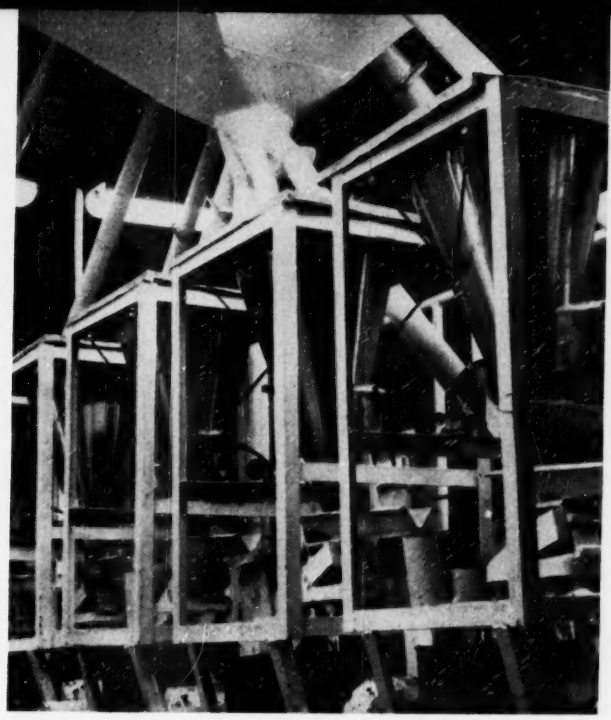


5 **BLANCHERS** remove the skins from roasted drawn up into cyclone collector and then bagg

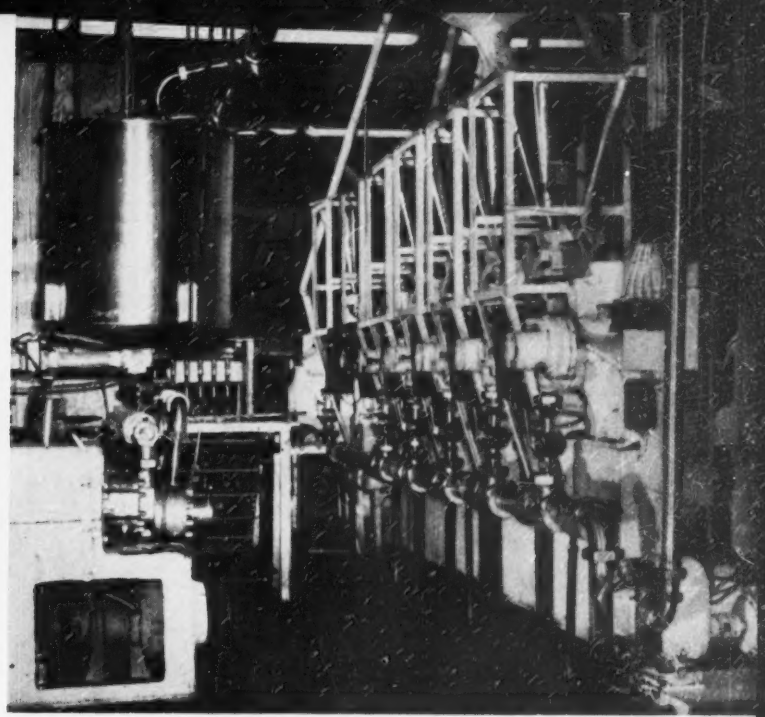
PEANUT BUTTER PROCE



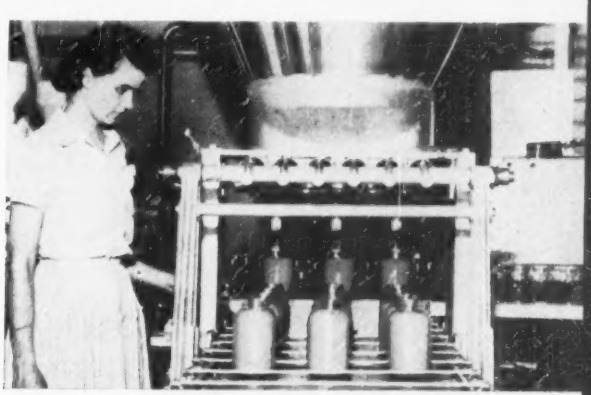
oasted nuts. Skins are bagged.



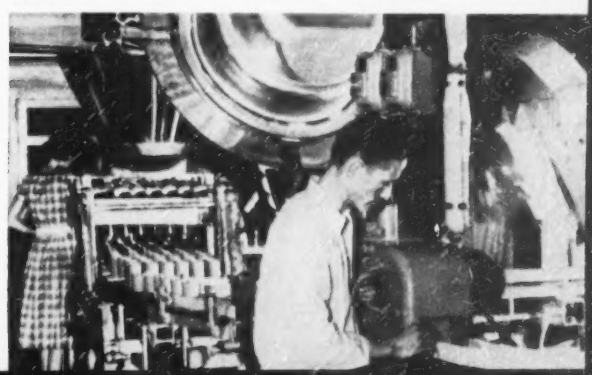
6 **INTO THE BUTTER** goes salt, via electric vibrators. Weight of this seasoning is automatically checked in the process.



7 **PEANUT BUTTER** from mills (right) travels via stainless steel manifold and sanitary pump to holding tank and then to homogenizer (left foreground).



8,9 **JARS** come from filler (above), then are unscrambled to go single file to vacuum closing unit (foreground, photo below).



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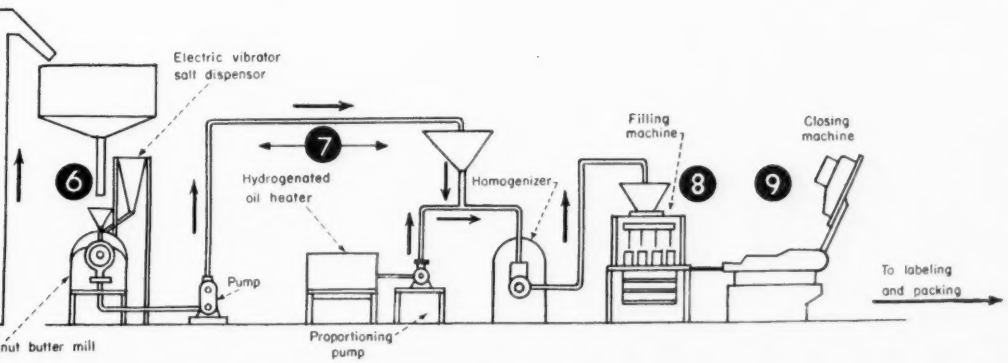
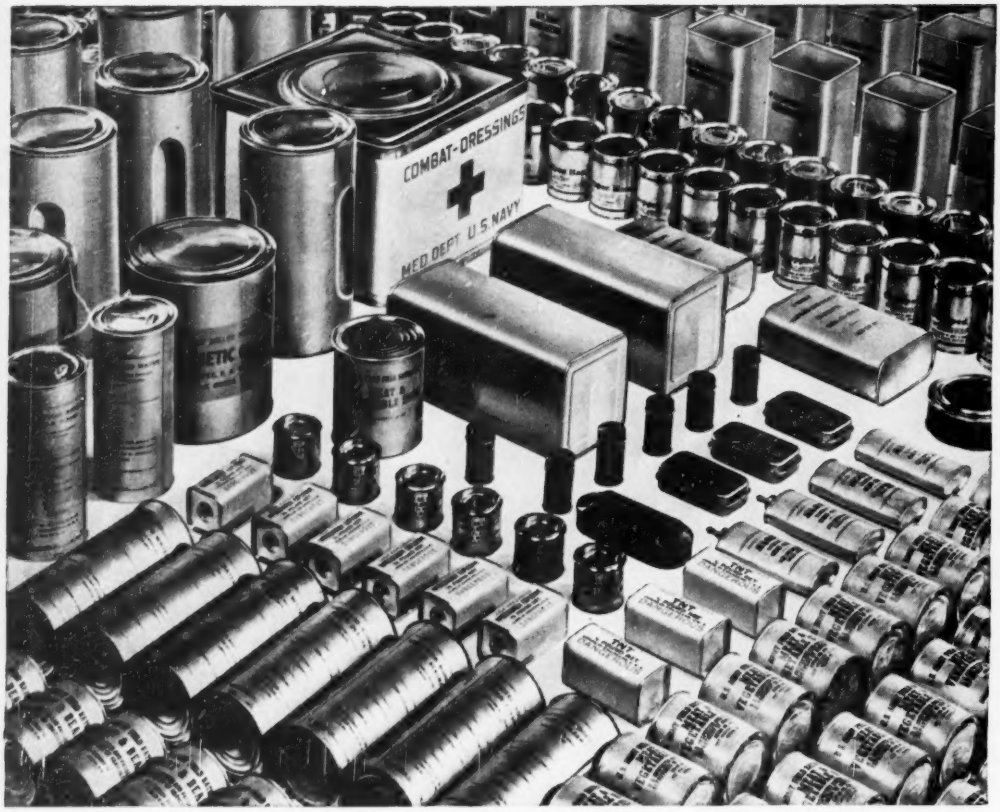




Did you pack any of these?

During World War II, our customers packed an astonishing variety of products in Canco containers for military use . . . . . Containers for field rations . . . blood-plasma transfusion kits . . . first-aid kits . . . TNT . . . land mines . . . demolition kits . . . and many other war items.

Canco was able to solve many unusual packaging problems, produce essential containers quickly, and in great numbers. This was because our years of experience had given us "know-how" unequalled in the industry.

Should you need this "know-how" today on packaging a product for military use, we shall be glad to consult with you.

SINCE the early 1900's we have been developing and building increasingly efficient closing machines and auxiliary and related equipment for lease to container users.

As of January 1, 1951, this entire line will be made available for sale as well as lease.

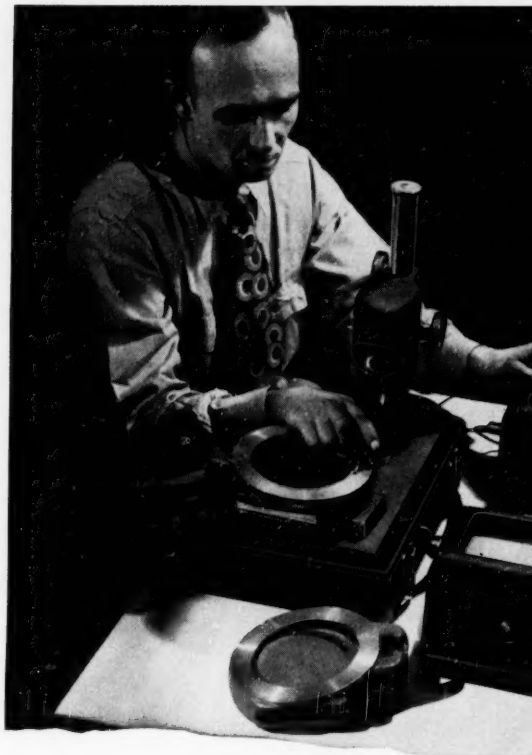
Details will be available shortly through our division offices in New York, Chicago and San Francisco.

CANCO

AMERICAN CAN COMPANY

New York • Chicago • San Francisco

More **CRANE VALVES** a



How CRANE controls quali
to the Micro-In
to cut your valve cos

Surface finish of a valve's working parts has a lot to with its wear resistance and operating efficiency. A cor finish means a tighter-seating valve, easier operation, greater of maintenance. In Crane Quality valves, the surface fi of machined parts is measured and controlled to rigid lim The standards for quality control of surface finish are determined the most scientific methods as shown above. Yes, noth is overlooked to make Crane Valves the lowest-cost val in the long run. *That's Crane Quali*

CRANE V

CRANE CO., *General Offices:* 836 S. M
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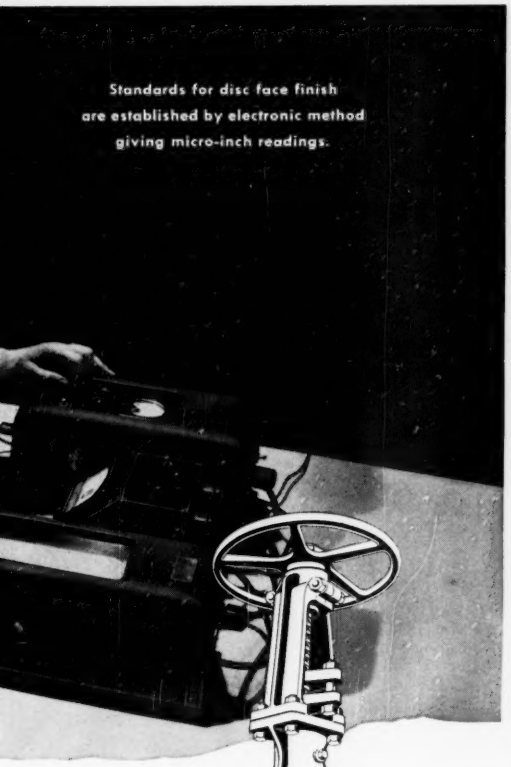
VALVES • FITTINGS • PIPE

S are used than any other make



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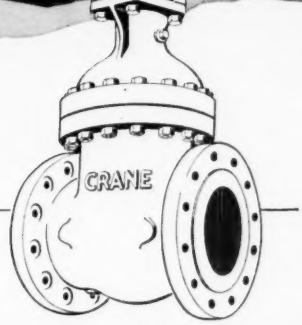
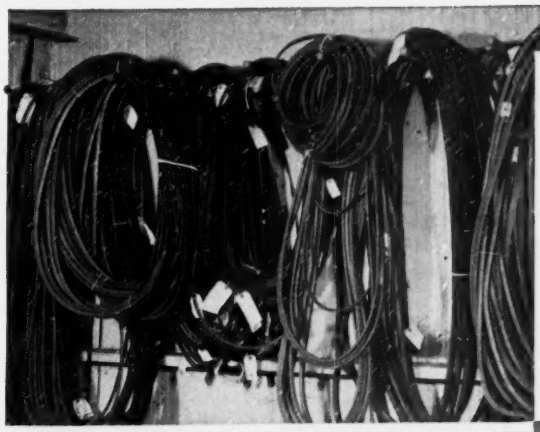


Precise quality control of materials, design, and manufacturing—to the highest degree in the industry—makes Crane valves the lowest cost valves in the long run. On steam service, oil and oil vapor lines, for example, you'll find Crane Steel Gate Valves a sure remedy for high maintenance costs. Talk it over with your Crane Representative.

VALVES

6 S. Michigan Ave., Chicago 5, Ill.
Serving All Industrial Areas

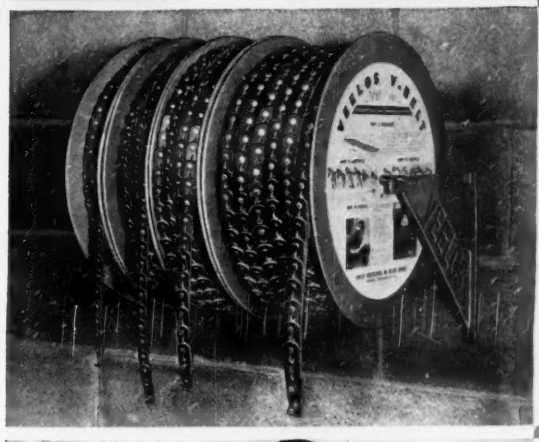
E • PLUMBING • HEATING



when you use v-belts, remember...

VEELOS CUTS COSTS ON V-BELT INVENTORIES

This large stock of endless v-belts is as unnecessary as it is costly and hard to keep under control. Switch to Veelos—the adjustable v-belt—and stop forever all this useless waste of time, space and money.



when you use v-belts, remember...

VEELOS IN STOCK MEANS ANY SIZE BELT IS INSTANTLY AVAILABLE

Just four reels of Veelos can take care of as many as 316 sizes—*every* v-belt need in the O, A, B and C widths. No cluttered stockroom, no control problem, no replacement difficulties when you standardize on Veelos in the widths you require.

when you use v-belts, remember...

VEELOS KEEPS MACHINES AT PEAK PRODUCTION

Veelos runs true for vibrationless, full power delivery. Veelos installs *quickly* and *easily*—and you never need to dismantle outboard bearings. Veelos can be simply adjusted to maintain uniform tension on all belts.

And, as a reminder...

Write for your free copy of the Veelos Data Book and have all the facts on this adjustable v-belt at your fingertips.

VEELOS
THE LINK
V-BELT

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

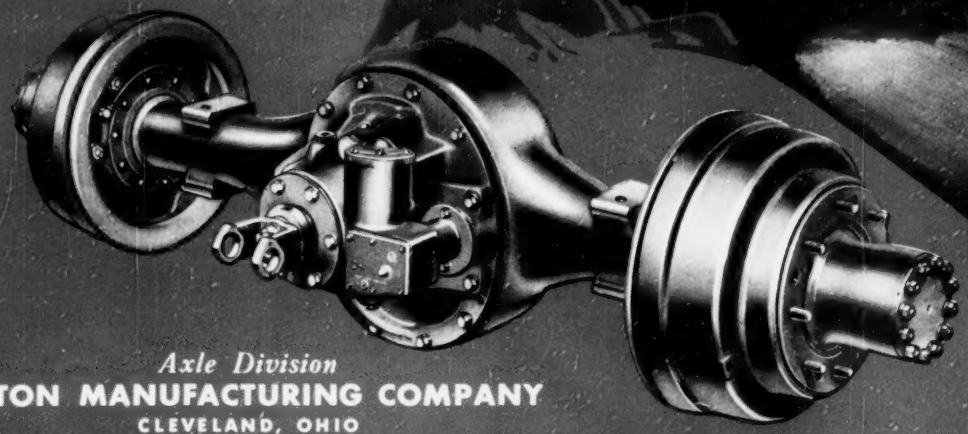
Made in all widths in three types: regular, oil-proof, static conducting. Also double V in A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. Veelos is known as VEELINK outside the United States.

MANHEIM MANUFACTURING & BELTING COMPANY, MANHEIM, PA.

EATON 2-Speed Truck AXLES

Give More Pay-Load Miles at Lower Cost per Mile

Trucks equipped with Eaton 2-Speed Axles make fewer stops for gas and oil. That's because these Eaton Axles double the number of available gear ratios in any truck, thus permitting the use of the most efficient ratio for every driving condition. As a result, the engine operates at economical speeds—doesn't strain and struggle on hills or when starting under full load . . . runs effortlessly on the straight-away. This means, too, that stress and wear on engine and major power transmission parts is minimized. These operating and maintenance economies—plus the higher trade-in value of Eaton equipped trucks—enable Eaton 2-Speed Axles to more than pay for themselves on trucks of the 1½ ton class and larger. Ask your truck dealer to show you what this means to you.

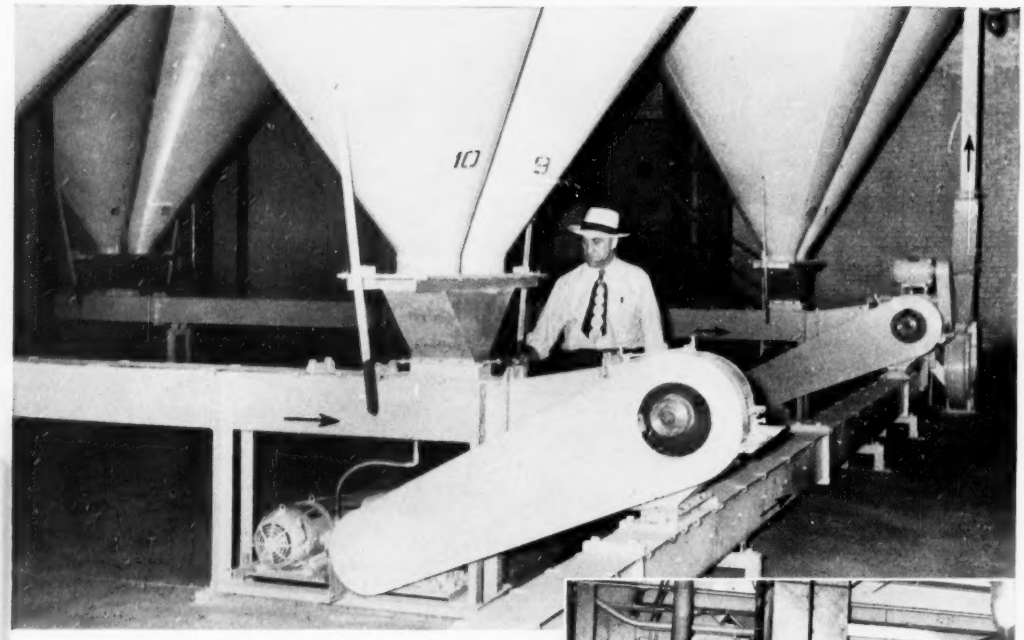


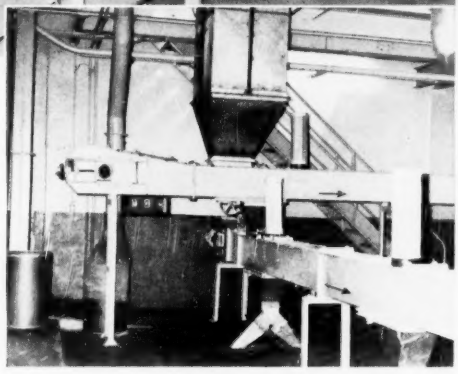
Axle Division

EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

EATON PRODUCTS: SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • JET ENGINE PARTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS SPRINGTITES • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS





Handling Grains Untouched by Hands

In the brewing of fine beer, it is essential that the ripe, choice grains be so "handled" as to protect them from any contamination. At the Theo. Hamm Brewing Company, St. Paul, Minnesota—where absolute cleanliness is a "must"—eleven S-A REDLER conveyors and one REDLER loop-boot type elevator are employed for storing, reclaiming and handling grains in the brewhouse. The sealed REDLER casings prevent contamination of grains during handling and prevent loss by spillage. The compactness of the system permits operation in close quarters where floor space is valuable and headroom restricted.

S-A Engineers have designed bulk handling systems for 50 years which combine all types of conveyors, elevators and accessory equipment. If *you* have a bulk materials handling problem, it will pay you to consult with S-A Engineers. Write today—without obligation.

THEO. HAMM BREWING CO.
ST. PAUL, MINN.

Grains are elevated to the top floor of the brewhouse where a horizontal REDLER conveyor receives and delivers them to three cross conveyors which discharge through multiple, gate-controlled chutes to 18 storage bins at an average rate of 25 tons per hour. Another series of horizontal REDLER conveyors underneath the storage bins reclaim from the bins and deliver to a collecting cross conveyor which feeds to the loop-boot feed section of a 64-foot high REDLER elevator. Grains are elevated to still another REDLER horizontal conveyor which moves them to a scale tank. This distributes through a 2-way chute to two horizontal-inclined REDLERS which convey grains to mash cookers.

STEPHEN S-A ADAMSON MFG. CO.

6 Ridgeway Avenue, Aurora, Illinois — Los Angeles, Calif. • Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

Century Type RS, repulsion start, induction, single phase brush lifting motors are ideal for installation on reciprocating pumps, compressors and other hard-to-start equipment.

They provide the power to start under load — even in very cold weather — without overmotoring the driven machine.

Repulsion start motors provide greater starting torque per ampere of current than any other type of single phase motor — consequently the least disturbance to line voltage — an advantage on long or small capacity transmission lines.

They are widely used in the rural areas which usually have only single phase energy.

Many power companies are recommending the use of single phase motors up to 7½ HP, in residential districts of the larger cities, because polyphase energy is not always available.

Century Type RS brush lifting motors are built in sizes from ½ to 20 HP.

Century builds a wide range of types of motors from 1/6 to 400 horsepower for all the popular electric power applications.

Specify Century motors for all your electric power requirements.

Popular types and standard ratings are available from factory and branch office stocks

CE-628

Century Motors

CENTURY ELECTRIC COMPANY · 1806 Pine St., St. Louis 3, Missouri

Offices and Stock Points in Principal Cities

New Packages and Products

Unique Frozen Specialties—Food for Thought, Too

A

On a recent trip to Gretchen Grant Kitchens, Inc., Jersey City, N. J., this department came across the rather unique frozen food specialties pictured above. Galaxy of ideas presented by all ten of the fresh frozen items should start many a food processor thinking of new taste possibilities.

Just introduced are the five products in the front row. At left is Chix-N-Blanket, a hot hors d'oeuvre. Here, smoked chicken is formed in sheep casings like regular cocktail frankfurters. Wrapped around each is a blanket of pastry. To serve, housewife places in preheated oven (390 deg. F.) for 10 min. Twelve of the chicken-franks are packaged in a re-usable polyethylene refrigerator bowl.

Next in line are smoked chicken-burgers. To be fried same as hamburgers, they are made of chicken, chicken fat and broth, eggs, skim milk, spices and seasoning. They are packaged in a waxed paperboard carton.

At bottom right are three new frozen spreads—anchovy, chicken liver, and smoked chicken. They come in flat-bottomed spherical glass bowls with screw-on caps. To serve, simply defrost.

Besides the anchovies, first named spread contains olive oil, cream cheese, pimentos, bread crumbs, onions and eggs. The chicken liver spread has the livers, chicken fat, eggs, vegetable shortening, and seasoning. Ingredients of the smoked chicken spread are same as for Chix-N-Blanket. All three spreads are recommended for canapes and hors d'oeuvres. They come in 3-oz. sizes.

In top row are frozen specialties that have been tested on the market for awhile, but as yet have been given relatively little publicity.

The cheese tortoni (left) is a blend of cream cheese, eggs, cream, gelatin, flavor, graham crackers, almonds and butter. Packaged in gusseted paper cups, they should stand for 10 min. before serving.

The potato puffs go well with beer or cocktails, or with any dinner. Ingredients are potatoes, eggs, butter shortening, onions and seasoning. They are ready after baking in preheated oven (425 deg. F.) for 15 min.

Same baking directions go for the pecan muffins, which can be served with preserves or butter. Ingredients are flour, milk, sugar, butter, eggs, vegetable shortening, salt,

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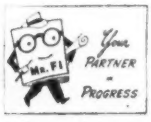
MR. FI KEEPS HIS EYE ON EVERY NEW FOOD AND DESIGN



—to inform you of all significant package and product developments and to direct your attention to the many promising items and innovations still in the infancy stage.

Keeping abreast of what the next fellow is doing is, of course, a must, but it's the man with the new ideas who takes the lead and sparks his industry.

That is just what Mr. FI has in mind—as in the frozen specialty writeup on this page. Here are ten unusual items that offer many times that number of ingredient-combination and taste-possibility ideas to you food processors who also are on the lookout for something new. Chicken-burgers, sure. And why not "hamburgerize" other kinds of meat?

Another tip as you read this department: When Mr. FI talks about new packaging for a particular product, chances are that some twist there will have application for your own product.

Finally, don't forget the Shorts at the end—they pack a good punch for their size.—The Editors

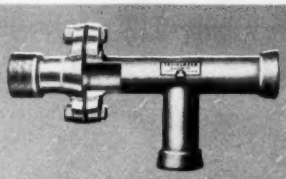
The Mark of Glass Craftsmanship

Armstrong's continuing reputation for top-quality glass is due in large part to the persistent and meticulous care of our glass craftsmen. This care . . . this skill produces glass containers which are accepted throughout the industry as superior in quality, dependability, and performance. Your Armstrong representative can show you how you can better your production records with quality containers. Write to Armstrong Cork Co., Glass and Closure Div., 4210 Prince St., Lancaster, Pa.

ARMSTRONG'S GLASS

It's TRI-CLOVER

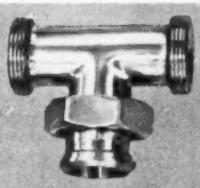
...The COMPLETE Line for ALL CORROSION-RESISTANT piping problems



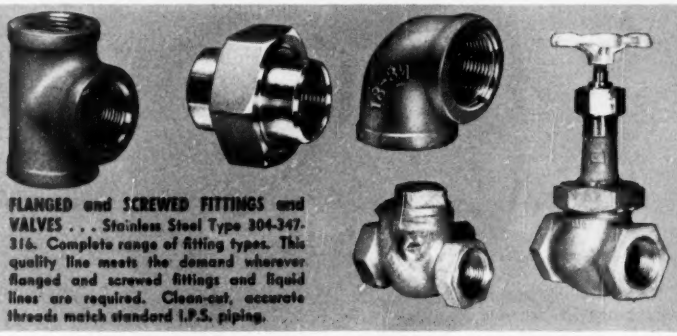
"ZEPHYRWELD"® WELDING FITTINGS . . . SS Type 304, 347 and 316—Inconel and other SS analyses. Fabricated in I.P.S. and O.D. Tube Size, ⅜ in. thru 24 in. — ells, tees, crosses, flanges, adapters, etc.

CONICAL END FITTINGS . . . Stainless Steel Type 316 — Inconel and other SS analyses. Complete line of ells, tees, crosses, laterals, reducers, etc., sizes from 1 in. thru 4 in. O.D. Features: Light weight—low cost — simple, fast installation — leak-tight — flanges of all types for every application — easily adapted to all other fitting types.

RECESSED-END FITTINGS . . . Stainless Steel Type 304-347-316. Low cost, light weight fittings designed for fast, simple soldering, brazing or socket welding, in sizes from ¾ in. thru 24 in. Full line of elbows, return bends, tees, crosses, adapters, etc.



"SANITARY" TYPE FITTINGS . . . Stainless Steel and Tri-Alloy (Nickel Alloy). Sizes from 1 in. thru 4 in. O.D., in full range of fitting types. Designed and approved as meeting 3A Standards throughout, incorporating numerous exclusive design and construction features.



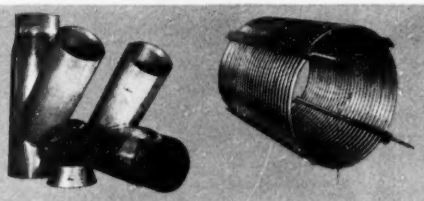
FLANGED and SCREWED FITTINGS and VALVES . . . Stainless Steel Type 304-347-316. Complete range of fitting types. This quality line meets the demand wherever flanged and screwed fittings and liquid lines are required. Clean-cut, accurate threads match standard I.P.S. piping.

SPECIALIZED MANUFACTURING FACILITIES

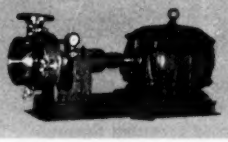
When it comes to expert welding and fabricating of complex assemblies, you just can't beat the speed and accuracy offered with TRI-CLOVER'S exclusive Heli-Arc Atomic Hydrogen Welding... a specialized semi-automatic process that assures highest quality and FULL corrosion resistance. *Shown here are a few typical examples of the wide variety of jobs we handle every day.*

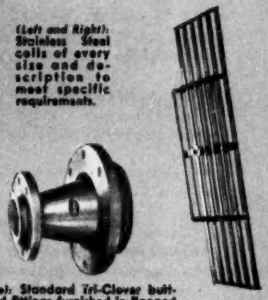
COMPLETE ANNEALING FACILITIES

EXPORT DIVISION 8 So. Michigan Ave., Chicago 3, U.S.A.



(Above): Special welded SS tubing and shapes. (Right): Tri-Clover Industrial Pumps — for every corrosion problem — capacities up to 1200 G.P.M. and up to 200 ft. head.





(Left and Right): Stainless Steel coils of every size and description to meet specific requirements.

(Above): Standard Tri-Clover butt-welded fittings furnished in flanged assemblies.

Tri-Clover MACHINE CO.
Kenosha, Wisconsin

TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

TRI-CLOVER THE Complete LINE

FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

Be sure to see The COMPLETE Line of Tri-Clover products at:
the BREWING INDUSTRIES EXPOSITION
Convention Hall, Philadelphia · October 3-6th—BOOTH 213
and the DAIRY INDUSTRIES SUPPLY ASS'N EXPOSITION
Convention Hall, Atlantic City · October 10-21st—BOOTH 512

leavening and pecans. The firm also makes blueberry and currant muffins.

"Hot Puffs", fourth in the line, comprise French pastry stuffed with either of four souffles—anchovy, cheese, chicken liver and frankfurter bits. For serving, they should be defrosted for 45 min., then placed in 425-deg.-F oven and heated until browned.

Last specialty, the Scotch Scones, have same ingredients as muffins, just different amounts. Same heating directions, too.

Powdered Milk in Quarts A

Three of these handy cellophane packets of powdered milk, each making a full quart, are packaged in the carton pictured above. The product, called Sanalac, is fresh mineral-rich milk, with butterfat removed.

To mix, housewife simply pours contents of one pack into a quart jar already filled with a pint of water. She shakes the jar until powder dissolves (about 15 sec.), then adds water to quart level and chills before drinking.

The powdered milk may also be whipped and served as a topping, and it can be used in cakes, desserts and various beverages.

The processor, Sanna Dairies, Inc., Madison, Wis., puts up his product in an attractive yellow carton. Open window at side shows the three separate cellophane packets of milk. Refrigeration is not needed.

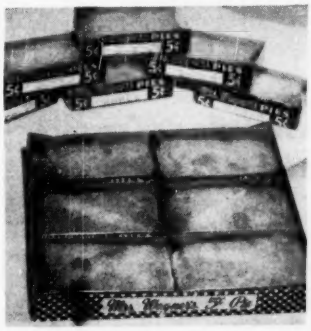
Want More Information?

It's free—and easy to get. Say, for instance, you want added details on the item marked "A" here on Page 117. Just turn to one of the special Reader Service postcards inside the front cover and circle the 117A. Sign at the bottom and mail — no stamp is needed. Then the extra information will be on its way to you.

Upside-Down Package B

A new eye-catching arrangement of packaging and exhibiting asparagus spears is upping sales of the product.

The innovator, P. J. Ritter Co., Bridgeton, N. J., uses a regular vacuum-sealed glass jar. Label is inverted and fixed near top, that then becomes bottom to give clear appealing view of the asparagus. Mass display of these inverted jars is particularly attractive.



5c. Pie Back in Boats C

Wagner Baking Corp., Newark, N. J., has brought back the nickel pie by packaging it in a printed cardboard boat, overwrapped with heat-sealable unprinted cellophane. This package costs far less than old individual paper bags for each pie, and the production rate is almost doubled. Besides these advantages, stockpiling of 15 varieties of paper bags is eliminated. Now, the pie's variety is printed right on the boats.

The pie itself is now made rectangular-shaped to fit the new package.

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A-5

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Grapes in Chocolate A

New candy specialty, resembling chocolate-coated cherries, but actually built around selected grapes, is being introduced by Chase Candy Co., San Jose, Calif.

Called "Mint Cordials," the new confection is processed with natural mint oil and green fruit, and cordialized in cream fondant. Coating is medium dark chocolate. The candy is packed in 4-color lithographed boxes, containing 10½ oz.

Breaded Fantail Shrimp B

Frozen and ready to be french fried, breaded fan tail shrimp are being introduced by Hamilton Foods, Inc., Chicago. Produced in a sanitary plant under rigid inspection, the shrimp are peeled, breaded and frozen, all in a matter of minutes.

The waxed carton is printed with an appetizing five-color reproduction of the fried shrimp.

To serve, the housewife thaws the shrimp for 5-10 min., then fries in deep hot fat for 3 min.

Seamless Plastic Cans C

Seamless acetate plastic containers, with standard tin can ends, have been introduced by Domar Products, Inc., Cleveland. Though resembling the familiar clear transparent sheeting cannisters, they are produced from extruded tubing and are equipped with a friction fit.

Termed liquid tight, containers can be used for refrigerated products. They are one-fifth as heavy as glass. Extrusion method of manufacture effects production savings.

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The 36" stainless steel SK Fume Scrubber with auxiliary spray nozzle stack, top view, is used on a battery of fat melters in a meat packing plant. The 6" cast iron SK Fume Scrubber, lower view, is used on a 4' diameter x 8' long, horizontal drum, fat melter. In this case, a large percentage of the fumes is water vapor which must be condensed.

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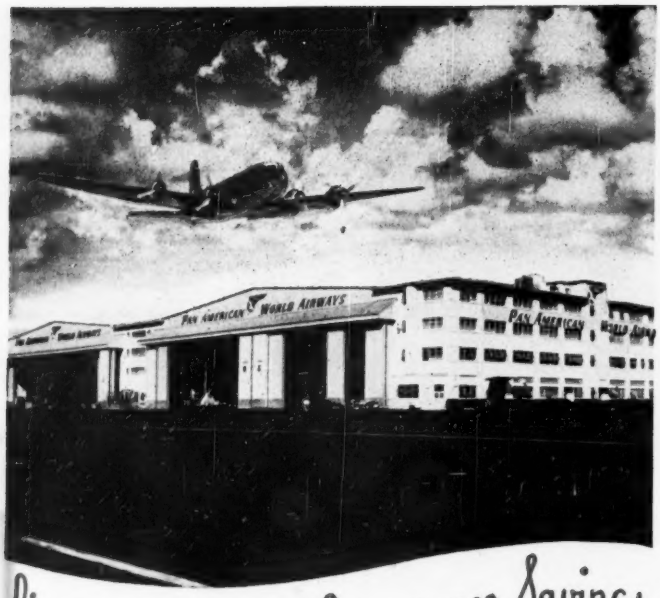

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A leading factor in the business economy of Pan American World Airways is evidenced in the extensive system of fire protection which was recently installed at the Company's huge Miami, Florida Overhaul Base. At this multi-million dollar facility, all classifications of aircraft, including giant Clippers costing as much as $1,500,000 each, undergo complete servicing and minute inspection. The entire operation is safeguarded from fire by means of "Automatic" Sprinkler systems, scientifically designed for the special hazard of airplane storage and repair. Over 15,000 fixed temperature and Rate-of-heat-Rise operated sprinklers are ready at all times to provide instant, effective protection at the first indication of flame.

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Ship Bread in Cartons A

A simple multiple-trip shipping container for bread is being used by the Jordan Baking Co., Tacoma, Wash. The corrugated-board cartons are good for an average of 25 trips. So, not only do they protect the bread, but they also result in lower handling costs.

Twenty loaves are placed in a carton, with a stapled shelf between layers. Staples do not interfere with bread wrappers. Carton dimensions are approximately 21x11x25 in. Arrow on each side indicates how bread should be stacked.

Container Corp. of America, Seattle Div., developed the carton.

Package & Product Shorts

Canned Franks With Mustard Sack B

Wieners with mustard relish sauce in a separate sealed plastic sack is new item on the canned meat shelf. The processor, Oscar Mayer & Co., Chicago, packs franks and mustard 13 oz. to a can.

New Orange Pudding C

Keeping in step with the doctor's advice that infants start drinking orange juice early, Gerber's Baby Foods, Fremont, Mich., has introduced Orange Pudding, a new dessert. It is strained and packed in 4½-oz. size.

Frozen Pancake Mix D

—is thawed, then pours right on the griddle. No mixing, no bother. That's the item put out by Suzette's, Langhorne, Pa.

Canned Rice Dinner E

Spanish-style rice that just has to be heated is being successfully marketed by Sylmar Packing Corp., Los Angeles. Made of rice, tomato puree, onions, sweet peppers and seasonings, it is recommended for use with left-over meats, as stuffing, and in place of potatoes.

Readily Spread Peanut Butter F

Beech-Nut Packing Co., Canajoharie, N. Y., is introducing an "Easy-To-Spread" peanut butter made by a new cold pack process. The homogenized product is quick-chilled. This is said to produce the tradenamed effect.

—*End*

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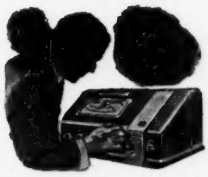

Spectrophotometric measurements—based on analysis of liquid, solid or gaseous samples by light absorption—have become one of the most important methods of today's process control operations. Complicated analyses requiring hours to perform by standard chemical procedures are now completed in a matter of minutes using modern spectrophotometric methods.

Up to the present, *quality* instruments have been beyond the reach of many laboratories. Now, however, the development of the new Beckman Model "B" Spectrophotometer makes available for the first time a *precision* instrument—convenient and simple to operate—*yet versatile, accurate and low-priced.*

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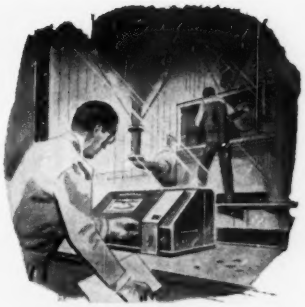

MANY VALUABLE APPLICATIONS IN FOOD PROCESSING

The Beckman Model "B" has many valuable applications in food processing. It can be used to control the quality and uniformity of food products . . . to detect impurities, harmful spray residues, etc. . . . and to check the content of important nutritional elements.

In addition, the Model "B" simplifies color control of both solid and liquid products—flour, spices, sugar, baked goods, liquors, condensed milk, fruit juices, soups, catsup, vegetable and mineral oils, and a wide range of other food products—wherever "color" is essential to attractiveness and marketability. The Model "B" reduces color specifications to definite fixed values that can be accurately reproduced, run-after-run, month-after-month.

The Model "B" is also used for research into vital food problems, such as determining the condition of foods during cooking, freezing and other processing operations . . . studying the effects of storage on foods . . . and other similar analyses to advance food processing techniques.

Let our trained staff make recommendations on the application of Beckman Model "B" Spectrophotometer savings to **your** operations. No obligation, of course.

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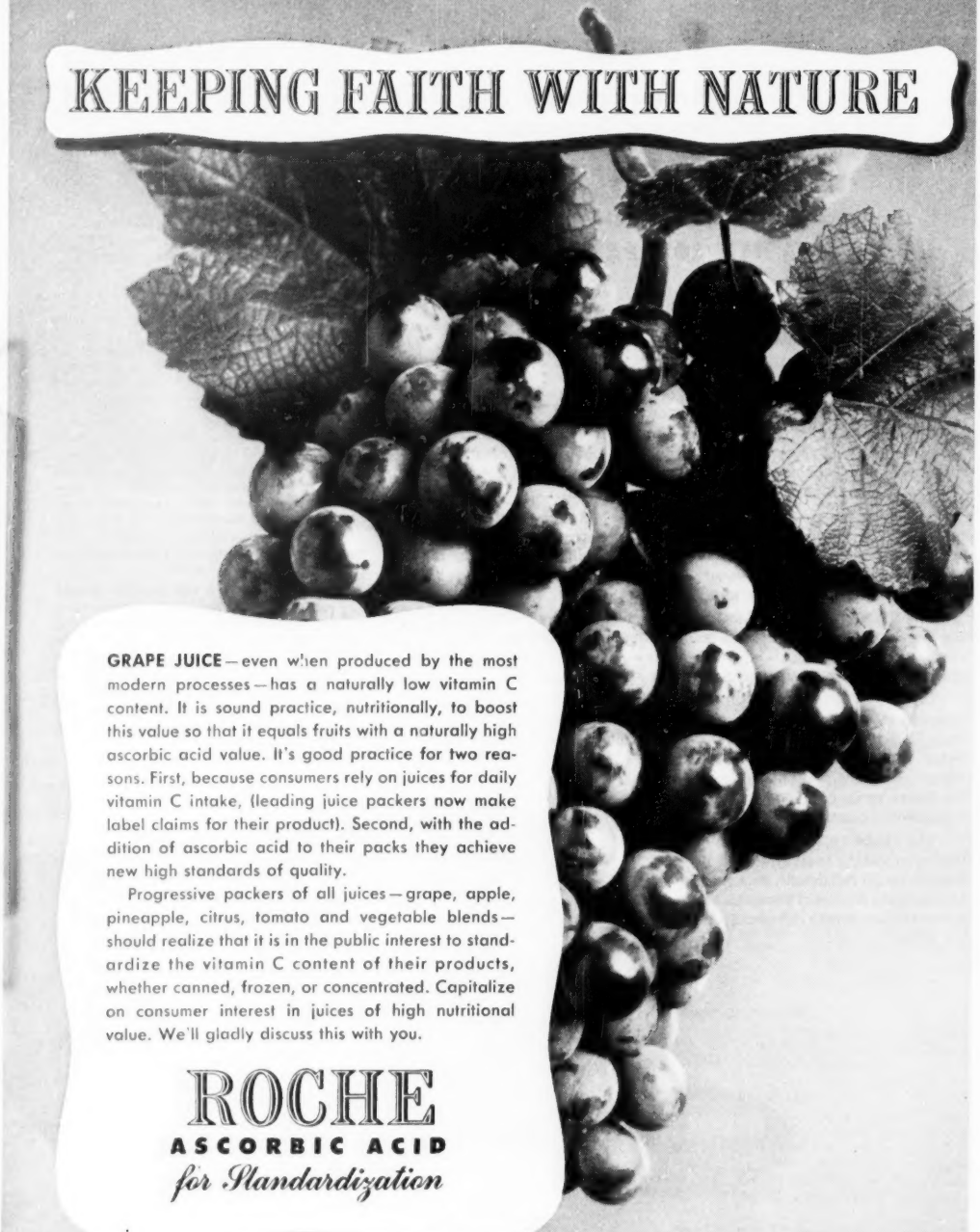

GRAPE JUICE—even when produced by the most modern processes—has a naturally low vitamin C content. It is sound practice, nutritionally, to boost this value so that it equals fruits with a naturally high ascorbic acid value. It's good practice for two reasons. First, because consumers rely on juices for daily vitamin C intake, (leading juice packers now make label claims for their product). Second, with the addition of ascorbic acid to their packs they achieve new high standards of quality.

Progressive packers of all juices—grape, apple, pineapple, citrus, tomato and vegetable blends—should realize that it is in the public interest to standardize the vitamin C content of their products, whether canned, frozen, or concentrated. Capitalize on consumer interest in juices of high nutritional value. We'll gladly discuss this with you.

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New Technology

Improved Freeze-Concentration Process Features Complete Recovery of Solids

A method of processing frozen fruit and vegetable juices to separate concentrate from ice and to recover essentially 100 percent of residual solids is the object of a recent patent.

Previous freeze-concentration methods have been too costly, too slow, or have resulted in loss of too much of the desired product. In the new method, these objections are overcome by improved manipulation of frozen juice in the form of a slurry. This is done by freezing juice at a temperature of 0 F. or lower, grinding the frozen product and mixing it with unfrozen juice, or concentrate, at a temperature close to its freezing point. This produces a free flowing slurry which can be centrifuged.

Slurrying equalizes the temperature of the frozen juice and slurry liquid without melting ice or requiring application of external heat beyond that dissipated in grinding and agitation. The slurry liquid is cooled by the frozen juice with the result that some water is frozen out of it, raising the density of that part of the slurry that remains unfrozen and is separated by centrifuging. (In the case of grape juice, solids content is raised from 15 to 22 percent in this step.)

In operation, residual ice from the above step is re-slurried with straight juice, the temperature permitted to equalize, and then centrifuged. This gives a product slightly higher in solids than the original juice, and an ice which, when melted, will contain 1 percent solids. At the beginning of the operation, this ice is melted and stored to be used in slurrying future batches of similar ice. This slurrying produces a centrifuged product of about 1½ percent solids and ice which, when melted, contains about 0.2 percent solids. Part of this ice is added to the 1½ percent juice to maintain a 1 percent solution; remainder is discarded.

For further concentration, juice from the first step (or straight juice) is frozen and re-slurried with 22 percent concentrate. After equalizing the temperature, and centrifuging, a product containing about 27 percent solids is obtained. This is used to slurry additional frozen juice made from straight juice with a resulting concentrate of 32 percent solids. By repeating the process once more, a concentrate of 35 percent solids is obtained.

Precautions must be taken to prevent heat pickup in all stages of the process so that slurry temperatures are below the freezing point of water.

Digest from U. S. Patent 2,503,695, issued Apr. 11, 1950, on an application dated Dec. 3, 1948, to R. E. Webb and F. W. Bedford, Dunkirk, N. Y., assigned to Bedford Products, Iulu, T. H.

Syrup From Fruit Juices

A syrup, derived from fruit, that is more satisfactory than sucrose as a sweetening agent for fruit compositions, is the subject of a recent patent. As an example, an aqueous solution may be prepared by treating the juice of grapes (or raisins), before or after separation from the pulp, with lime and phosphoric acid to eliminate the acids and ash-forming materials.

Resulting syrup is free from color or flavor of the fruit from which it was derived, and is without taste or odor. When added to canned fruit, juice, or nectar it provides an improved food product of superior color, appearance and taste.

Little or no osmosis takes place and there is no observable tendency to break down the structure of the fruit. Sweetening equivalent is about 1¼ times that of sucrose.

Digest from U. S. Patent 2,499,375, issued Mar. 7, 1950, on an application dated Oct. 1, 1941, to A. M. Erickson, San Jose, Calif., and assigned to Hawaiian Pineapple Co., Ltd., Honolulu, T. H.

DAIRY

Cheese Flavor Improved By Filbert Nut Enzymes

American cheese of superior flavor can be produced with the aid of chemical agents obtained from filbert nuts. The chemicals are known as proteolytic enzymes. In the experiments, samples of Cheddar cheese were taken from a commercial cheese vat after milling and salting. A measured volume of the filbert extract was added to each experimental sample, and an equal amount of water was added to the controls. Regular processing and storage procedures were then carried out. All samples were checked at regular intervals. At the end of four months, expert tasters found the flavor of the filbert-extract cheese to be superior to the controls. In addition to improved flavor, the ripening time was substantially shortened. And no filbert nut flavor was transferred to the cheese.

Digest from "Better-Tasting American Cheese Made With Filbert Nut Extract," a paper by A. B. Parpia, R. W. Stein, T. B. Niven and E. H. Wiegand, Oregon State College, presented at ACS meeting, Chicago, Sept. 4, 1950.

Liquid Foods Preserved With Molecular Oxygen

Treatment to inhibit or retard the action of bacteria in milk, fruit and vegetable juices, soups, etc., by bubbling molecular oxygen through the liquid, is disclosed in a recent patent. Milk, for example, is run into a sterile tank which is fitted with a tight cover and a central pipe extending downward into the milk. Oxygen is bubbled through the mass until air has been displaced through a bleeder valve. The latter is then closed and the flow of oxygen continued until an internal pressure of about 6 atmospheres has been built up. This is maintained for about 4 hr., after which the pressure is released to 3 atmospheres. Under this pressure the milk may be preserved for from 6 to 10 days.

If longer preservation is desired additional steps must be taken. The milk is treated with carbon dioxide in a steam-jacketed vessel in the manner previously prescribed for oxygen, and

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at the end of the cycle steam is admitted to the jacket to warm the mass of milk to about 70 deg. C. The oxygen treatment is then repeated, and the milk stored under a pressure of 3 atmospheres.

Digest from U. S. Patent 2,499,243, issued Feb. 28, 1950, on an application dated Sept. 19, 1945, to Alberto Franklin, Caracas, Venezuela.

CEREAL PRODUCTS

Modified Soy Protein Process Gives Better Whipping Agent

Improvement in the preparation of modified soy protein, and more particularly modified glycinin, for use as a whipping agent in making candies, meringues, and other food products, is the subject of a recent patent. In the first step of the process, oil-free soy flakes are extracted with an alkaline solution at a pH of 8-10.5. Plant operation at 85 F. and pH of 8.5 has given excellent results.

After about an hour of alkaline extraction under agitation, the operation is stopped and the slurry is allowed to settle for about 3 hr. The clear supernatant liquid is drawn off. An equal amount of water is added, and the agitation and settling processes are repeated. The supernatant liquid is again removed and added to the first lot, and their pH is lowered to about 4.2 in order to precipitate the glycinin which is allowed to settle for 8 hr.

The curd thus obtained is subjected to enzymatic modification through the use of a proteolytic enzyme, such as pepsin, at a pH of 2-3 and a temperature of 100-110 F. Enzymatic action is stopped at the end of 1½ hr., after which the product may be dried in any suitable manner. For maximum whipping quality, the solution may be centrifuged before drying.

Digest from U. S. Patent 2,502,029, issued Mar. 28, 1950, on an application dated Jan. 26, 1946, to Louis Sair, St. Louis, Mo., and Richard Rathman, Decatur, Ind., assigned to Central Soya Co., Inc., Ft. Wayne, Ind.

MICROBIOLOGY

Acid In Mayonnaise Kills Off Bacteria

Due to their acid content, mayonnaise and salad dressing are not probable sources of *Staphylococci* or *Salmonellae* food poisoning. These were conclusions drawn from experiments in which 9 different strains of the above bacteria were added (approximately 1 million per g.) to salad dressing and mayonnaise.

When the products were made with

LENGTH of Time Food Poisoning Organisms Survived (Hours)

Organism	Mayonnaise pH 3.8	Mayonnaise pH 5.0	Salad Dressing pH 3.2	Salad Dressing pH 4.4
Staphylococcus 172	96	144	30	168
Staphylococcus 178	96	144	30	120
Staphylococcus 196	96	144	30	120
S. schottmuelleri	12	144	6	144
S. typhimurium	12	144	1	120
S. paratyphi	6	156	6	24
S. enteritidis	6	156	1	96
S. choleraesuis	1	156	1	96
S. pullorum	6	132	1	96

fresh and emulsol-inoculated egg yolks, total counts were approximately 100,000 per g. Survival time was longest in products made with fresh yolks, and the bacteria remained viable longer in mayonnaise than in salad dressing.

The one ingredient which had the greatest influence on viability of the bacteria was acetic acid. Decreasing acid increased survival time.

Digest from "Viability of Food-Poisoning *Staphylococci* and *Salmonellae* in Salad Dressing and Mayonnaise," by M. C. Wethington and F. W. Fabian, *Food Research*, 125–134, March-April, 1950.

FATS AND OILS

Extracting Cottonseed With Isopropanol

Although extraction of cottonseed with isopropanol produces a meal of superior nutritive value compared with the average meal obtained by hydraulic methods, the solvent has serious disadvantages. Its latent heat of vaporization is nearly double that of hexane; and it forms a constant boiling mixture with water at 91 percent by volume which has a low solvent capacity for oil.

The miscella is limited to about 10 percent extractables, which requires a high solvent-to-meats ratio. This, when combined with the high latent heat, necessitates high steam requirements. Use of acetone would reduce heat requirements, but it has the disadvantage of greater fire hazard and higher cost. Both solvents were tested to see what advantages might be gained by cooling the miscella to separate a solvent phase from the oil, and recycling this phase back through the rich end of the extractor. Effect of recycling was determined on fresh solvent requirements and extraction efficiency as well as on the products, oil and meal.

Results of the work show that recycling a solvent such as acetone or isopropanol will effect considerable solvent economy, permit reduction of free gossypol in the meal, and yield an efficient recovery of neutral oil. Solvent-to-meats ratio was 1:1, producing some solvent phase in addition to the oil phase. This "bleed stream" is rich in fatty acids, phospholipids, and sterols. After solvent evaporation the non-

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Huron's specialized service is always available to suggest ways of obtaining maximum taste value consistent with economy through use of Huron MSG and HVP. To those who have not used our service, we suggest a simple way in which you can prove the advantage of using Huron MSG and HVP. For example, in

MEAT PRODUCTS:

To corned beef hash and hamburgers add 0.15% MSG. In stews and meat and vegetable mixtures use MSG from 0.1% to 0.2%. For those meat and vegetable mixtures with strong, braised meat flavors, Huron HVP products are more suitable. While these are prepared as liquids, pastes and powders, the liquid HVP is more convenient for use in the products above at levels ranging from 0.5% to 2.0%.

In sausages, wieners, loaves and similar meats, use MSG at levels from 0.1% to 0.3%. Dark colored and more highly seasoned sausage products more effectively use Huron HVP powders from 0.1% to 0.5%. Hams and bacon are improved by the addition of 0.1% MSG, introduced through the curing pickle.

Call on us in confidence for assistance. Samples will be sent immediately with specific recommendations.

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MILLING COMPANY
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volatile matter could be sold as soap stock or used for byproduct recovery. The "oil balance" for a recycled isopropanol run showed recovery of edible product amounting to 92.9 percent of the original oil in the meats.

Digest from "Isopropanol as a Solvent for Extraction of Cottonseed Oil. III. The Use of Recycling to Effect Solvent Economy," by W. D. Harris and J. W. Hayward, *Journal of the American Oil Chemists' Society*, Vol. 27, 273-75, July, 1950.

FISH

Antibiotics Effectively Retard Bacterial Spoilage of Fish

Ever since sodium nitrite was found to retard the bacterial spoilage of fish, attempts have been made to find an even better preservative. Experiments made with ethylene oxide, propylene oxide, methyl bromide, streptomycin, and penicillin, did not prove promising. Sulphathiazole and sulphanilamide had a marked effect, but were not so good as sodium nitrite.

Still later investigations showed that dehydroacetic acid, monobromoacetic acid ester (Sopura), subtilin, and chloromycetin exerted only mild or feeble preservative effects. Aureomycin gave consistently good results, with marked suppression of bacterial growth at levels of 10, 25, and 50 ppm. In one test with terramycin at the 10 ppm. level it proved as effective as aureomycin. Although the results are regarded as purely exploratory and preliminary, they indicate that bacterial spoilage of fish may be significantly inhibited by the use of almost trace quantities of antibiotics.

Digest from "Effect of Several Antibiotics and Food Preservatives in Retarding Bacterial Spoilage of Fish," by H. L. A. Tarr, B. A. Southcott, and H. M. Bissett, *Progress Reports*, No. 83, 35-38, Pacific Fisheries Experimental Station, 898 Richards St., Vancouver, B. C., July, 1950.

FERMENTATION

Food Yeast Can Be Produced From Wood Carbohydrates

In the course of investigations made during the last war on the production of alcohol from wood waste, experiments were performed concurrently on the growth of yeast in order to get more information on the properties of the sugar. Numerous tests were made on batch and continuous propagation with different types of equipment in order to determine the optimum conditions for yeast production. Results indicated that a food yeast, high in protein and vitamins, can be produced rapidly and in good yields from the

carbohydrate in wood waste or from carbohydrates in byproducts from the chemical processing of wood. Propagation of food yeast requires the following nutrients per 100 lb. of wood sugar to give the maximum yield of yeast: 3.4 lb. nitrogen, 1.6 lb. phosphoric anhydride, and 1.1 lb. potassium chloride or sulphate. The product contains about 50 percent protein, 4 percent fat, small amounts of vitamin B_1 and large amounts of B_2.

Digest from *Food-Yeast Production from Wood-Processing Byproducts*, by Elwin E. Harris, Report No. D1754, Forest Products Laboratory, Madison, Wis. Dec. 1949.

BAKING

Dough Extrusion Apparatus

Substituting automatic for manual controls in extruding doughy or other mobile food material constitutes the basis of patented pressure extrusion apparatus. Electrical devices start and stop the extrusion process in response to the quantity of material in the supply tank, thus avoiding the spattering of dough from the discharge outlet when the supply tank is about empty, and making unnecessary the resulting cleaning operations.

In the patented apparatus an electrode or contact element, sealed within a sleeve of insulating material, is embedded in the wall of the supply tank. The latter is grounded and serves as one terminal of an electrical circuit, of which the embedded electrode is the other. The circuit will be closed when the terminal elements are bridged by the mobile material in the tank, which is electrically conductive. The circuit will likewise be opened when there is no longer sufficient material in the tank to bridge the elements. Thus the starting and stopping of extrusion can be automatically controlled by admitting compressed air or excluding it in accordance with conditions within the supply tank.

Digest from U. S. Patent 2,499,206, issued Feb. 28, 1950, on an application dated Oct. 5, 1945, to Paul A. Wolff, Hoboken, N. J., assigned to General Baking Co., New York City.

Adding Shortening as Liquid Improves Cake Mixes

Flour and shortening are the principal ingredients of dry culinary mixes for making cakes, muffins, and other baked products. For these mixes, a so-called "plastic" shortening has been preferred, and great pains have been taken to develop shortenings with optimum plastic properties. This has commonly been achieved by quick chilling with agitation followed by tempering after the shortening has been packed

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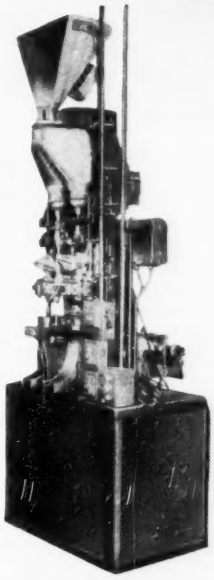

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MODEL A AUGER SHOWN—ideal for contract packaging. Output 60 to 150 per min.—5 cu. in. to 20 cu. in.; 1¼" x 1½" to 2⅜" x 6½". Feeds by auger-type screw, from hopper reservoir. Pillow-type package, with or without gusset—all heat-sealing materials. Equipped with photo-electric control. 4' x 4' x 8'; wght. 1951 lbs.; 2-½ HP motors, total load, 1582 w.

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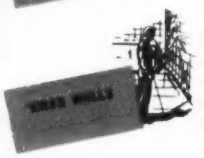
NO more time-consuming hand-scraping or wire-brushing to clean walls, floors and equipment. Now all you do is switch on the Oakite Hot-Spray Unit, open up spray-gun valve and begin to wet down surfaces with hot cleaning solution.

Wheel-mounted, this mechanical spray-cleaner can be piloted around your plant for quick, easy operation wherever cleaning or paint-stripping is required.

Unit develops and delivers a controllable combination of the three most essential cleaning elements—heat, pressure and detergency. Delivers 1¾ gallons of hard-hitting cleaning solution per minute at 30 pounds pressure.



The Oakite Hot-Spray Unit has almost unlimited possibilities! Using specialized Oakite cleaning materials you can remove food residues from equipment, floors, tanks. You can strip paint with it. Many meat packers use it to derust and descale belly boxes and the like.

Use the Oakite Hot-Spray Unit and ONE man to speed up your cleaning chores, simplify them and REDUCE YOUR CLEANING COSTS. Your local Oakite Technical Service Representative will gladly give you details on models No. 482 and 451. Or write address below for descriptive data.

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in drums. Plasticity resulting from this tempering process is believed to be responsible for the desirable baking properties of the shortening. To blend it with the flour and other ingredients of the mix, however, requires considerable labor and mixing power.

A recently patented process calls for putting fresh shortening through a Votator and then mixing it directly with the flour and other components of the mix—with less labor and mixing power. The inventor has found that cakes made from this type of mix are superior in many respects, particularly cake volume, to those made with plastic shortening. Other points in which cakes made from these mixes excelled were fineness of grain, tenderness of crumb, texture of crust, and flavor. The invention has the advantage of adapting premixing processes to continuous operation, utilizing the shortening in its liquid state without requiring packing and tempering.

Digest from U. S. Patent 2,499,586, issued Mar. 7, 1950, on an application dated Jan. 22, 1948, to Ogden Johnson, Bronxville, N. Y., and assigned to Ford, Bacon & Davis, Inc., New York City.

MISCELLANEOUS

Newly Developed Refrigerant Ups Compressor Capacity

Development of a new refrigerant to meet a predetermined set of specifications was undertaken because it is desirable to match compressor load to motor capacity, and to provide a series of refrigerants with small steps of capacity to match the refrigeration cycle. Economic design of a line of compressors for comfort air conditioning dictates a speed of 1,750 rpm. with Freon-12 as the refrigerant. There is, however, need for a refrigerant with about 20 percent additional horsepower and capacity to meet certain conditions: Fill job requirements falling between existing compressor capacities; match additional motor sizes within and beyond the Freon-12 compressor line; utilize full motor capacities for commercial refrigeration; increase capacity of existing installations; and raise the capacity of 25- and 50-cycle systems to equal the 60-cycle system constructed to operate with Freon-12.

The objectives called for a refrigerant having a boiling temperature of minus 29.2 F.; a pressure-temperature requirement of 205 psia. at 120 F.; molecular weight near the lower end of the range 90 to 150; high chemical stability with respect to flammability and decomposition at high temperatures; nontoxic and noncorrosive. Research resulted in the development

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POLYETHYLENE-COATED PACKAGING PAPERS

• New equipment at Riegel Mills extrudes polyethylene film (without laminating agent) on endless variety of lightweight packaging papers... foil, glassines, greaseproofs, sulphites...as well as on heavy paper and board.

A vast new field of applications for polyethylene has been created by Riegel's extrusion of this new film on nearly all types of lightweight packaging paper. Such combinations provide technical qualities impossible to secure with polyethylene or paper alone. Printing costs are reduced, body and stiffness easily supplied and remarkably tight seals obtained at high operating speeds ...often at lower cost than film alone or present materials. Here are the facts.

How Polyethylene Offers Better Protection. Riegel polyethylene-coated papers have excellent resistance to water, moisture, chemicals and solvents. Even acids and alkalis can be packaged. Moisture vapor transmission resistance and flexibility are extremely good at low temperatures, making ideal packaging papers for the frozen food field. There is excellent resistance to animal and vegetable oils and fats, and good resistance to mineral oils. Polyethylene-coated papers are tasteless, odorless and nontoxic. They will not crack under repeated folding at minus 40° F. They not only maintain their protective qualities at sub-zero temperatures but will hold hot coffee or soup satisfactorily. Blocking resistance is excellent even under tropical conditions. Polyethylene papers have tough scuff resistance and a puncture resistant surface.

In appearance Riegel polyethylene-coated papers have a high gloss and offer excellent sales appeal.

Perfect Packages at High Speed. Riegel polyethylene-coated papers form smoothly at high speed. They can be heat-sealed at 250° F. Strong fast seals can be made coating-to-coating or coating-to-base paper. The extensibility of the coating under stress allows it to retain its form as a film even if the paper fibers are torn apart. Heat sealing is recommended for these papers although some rubber base adhesives have given good results.

Extensive Laboratory Facilities Ready to Check Your Application. Because polyethylene has a few peculiarities, every new application should be checked carefully, whether it be all film or a film and glassine combination. Our Paper Performance Laboratory will thoroughly check each application individually. In many cases a special Riegel paper can be selected to supplement the properties of the polyethylene – in all cases our packaging engineers will be able to choose from over 600 different Riegel papers to give you the best combination for your specific requirements.

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IN-PLANT CHLORINATION can do
"Member of National Canners Association"
BAKER CANNING COMPANY
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PACKERS OF NUMBER 10 TINS
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Gentlemen:
We have been using In-Plant Chlorination for a few years, and feel that this piece of equipment is just as important in a canning factory as any other piece of equipment used in the processing of canned foods.
The first year we installed In-Plant Chlorination we had chemists make bacteria counts, and checks at approximately fourteen points throughout the plant, such as picking table belts, flume systems, washers, blanchers, fillers, closing machines etc. In making these tests we did not use In-Plant Chlorination for one week, and the next week we used In-Plant Chlorination in order to make comparisons as to bacteria count.
The reduction in bacteria count, between the two operations is almost unbelieveable. We found that by using this equipment properly, and increasing the dosage at clean-up time, we eliminated bacteria at many of the check points. One cannot, however, install In-Plant Chlorination and forget about a good housekeeping job. This would be an error, indeed.
However, by having In-Plant Chlorination, and doing a good job of house-cleaning, one can elimainate the building up of bacteria in most any piece of equipment. We do find that by using In-Plant Chlorination the clean-up time necessary at clean-up periods is practically cut in half.
You may use this letter in part or in full - for any purpose you care to.
Yours very truly,
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RDB:eal
In-Plant Chlorination, engineered by Wallace & Tiernan, can help your plant, too. Bacterial counts are reduced, odors controlled, and on-the-line time for processing equipment increased when you use this proven method.
Call your nearest W & T Representative now for complete information.
Other services by Wallace & Tiernan Associated Companies include Merchen Feeders for precision blending BY WEIGHT; Richmond Sifters for all separating problems involving powdered or ground materials; and Richmond Permaflux Magnets for the complete elimination of any ferro-metallic contamination of your food line.
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of an azeotropic mixture of Freon-12 and Genetron-100 (asymmetrical difluoroethane) in approximate proportion of 3 to 1, which effectively met the original specifications. The mixture is known as Carrene-7. It has been extensively tested and found applicable to a wide range of refrigeration systems of the type designed to use Freon refrigerants, and where additional capacity is desired beyond that obtained with Freon-12. The new product is not yet commercially available.

Digest from "Carrene-7, A New Refrigerant," by C. M. Ashley, *Refrigerating Engineer*, 553-57, 605-06, June, 1950.

Machine Coats Tacky Candy

Simple in construction and operation is a patented machine designed to distribute a coating of granular material, such as broken nut meats, sugar, or other edible substances on a core of candy having a tacky surface. Essential element of the machine is an inclined hopper so mounted as to oscillate about a horizontal axis. Granular material, such as nut meats, is placed in the hopper, and a sphere of candy having a tacky surface is dropped into it. Due to the inclination of the hopper the candy will tend to move toward the outlet, and by reason of the oscillating motion it will be rolled from side to side and gather a coating of the material.

Digest from U. S. Patent 2,504,037, issued Apr. 11, 1950, on an application dated Nov. 25, 1946, to William F. Murray, Washington, D. C.

Food Frozen In Flight

According to a recent patent, it is proposed to refrigerate food products carried as cargo in planes flying at high altitudes. To facilitate the operation, atmospheric air is admitted to the cargo space in the fuselage by means of ducts or inlets from the leading edge of the wings. Tests indicate that food products can be cooled from a ground temperature of 70 F. to −40 F. in a cargo aircraft flying at an elevation of from 15,000-30,000 ft. above sea level at an air speed of about 150 mph.

When fresh food products are to be refrigerated, they are placed on shelves in such a manner as to expose as much surface as possible to the cold air. Foods frozen prior to loading can be stacked more densely. As many as 8,000 packages of fresh food totalling 20,000 lb. could be loaded in a cargo space of 7x6x25 ft. and still leave space for passage of air at the rate of 7,500 cu. ft. per min, without developing excessive velocities in the air ducts.

Digest from U. S. Patent 2,501,898, issued Mar. 28, 1950, on an application dated July 29, 1943, to W. B. Haggerty, Tampa, Fla., assigned to Tampa Aviation, Inc.

—End

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vitamin A

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DPi Distilled Vitamin A Concentrate

For use in pharmaceutical or food products, old or new, there is no natural vitamin A more uniform and stable—none more effective biologically. DPi's molecularly distilled vitamin A is unexcelled among concentrates from natural materials for blandness.

Supplied in any potency you specify from 50,000 to 500,000 U.S.P. XIV units per gram, in containers ranging up to 55-gallon drums.

Myvax 16 Synthetic Vitamin A Palmitate

For use in high-potency preparations, this product of synthetic chemistry has constant stability and biological activity comparable to that of distilled natural vitamin A esters at the same potency. Its stability in the presence of polar solvents is high, and its taste and odor are mild and pleasant.

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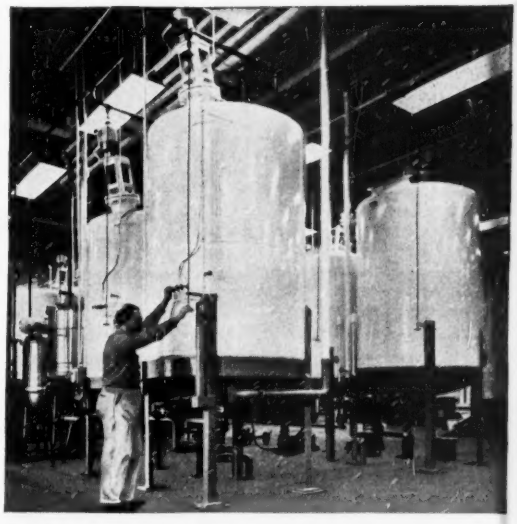

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Myvapack Distilled Vitamin A Concentrate is packed to your order—custom-blended in these great tanks. Each sealed can contains exactly 400 grams of oil with the correct potency to enrich one batch of your product. Easy to ship and store.

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Now Add This

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Ask a Crown Sales Representative about the new 6 oz. TALL Spra-tainer. Make sure the container *you* use is Spra-tainer —*first on the market, first in sales* — "*no-side-seam*" — "*no-top-seam.*"

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Please have a Crown Sales Representative call, and send me literature on the Spra-tainer.

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Food Industry News

Government Food Markets Survey Reveals Handling Margins

An interesting collection of facts on the costs and profit margins in the marketing of canned and frozen fruits was assembled as a result of a survey made by USDA Agricultural Economist C. W. Peters.

A principal purpose of the research project was the measurement of average margins taken at the various levels of trade in moving certain fruits and vegetables from the grower to the consumer in canned or frozen form.

Retail Margins

Price data collected indicates that the average margin taken by the retailer of seven canned fruits and vegetables during the period covered by this study ranged from a low of 17 percent on freestone peaches to a high of nearly 22 percent on sweet corn. For the four frozen foods the spread varied from 19 percent on strawberries to 21 percent on peaches.

A smaller retail margin was generally found on canned peaches and pears than on the "big four" among the vegetables: Green beans, corn, peas, tomatoes. The range in the margins was much less for frozen items than for canned goods. This result should be expected in view of general adherence to a more uniform pricing policy in the frozen foods trade, Peters explains.

One question discussed during the course of the visits at retail stores had to do with changes in mark-up policy since July 1, 1948. At least three-fourths of the food dealers questioned on this point said that the *percentage* of mark-up in cents per unit had not changed during the last 1½ years but that the *amount* of the mark-up per unit had dropped. The latter observation would be logical in view of the fact that prices of most canned and frozen fruits and vegetables have declined since July 1, 1948.

Wholesale Margins

Average margins taken by wholesale distributors of the canned fruits and vegetables included in this project ranged from a low of 3.4 percent of the retail price for tomatoes to a high of 7.5 percent for green beans. This percentage based on retail selling price is equivalent to the cents per dollar of consumer expenditure for the commodities involved. On the frozen items, the range was somewhat narrower—from 8.9 percent on strawberries to 11.9 percent on baby limas. By direct comparison, these wholesale margins are from one-fifth to three-fifths of the amount taken at the retail level.

Margins taken by distributors of four frozen foods are considerably larger than those found on the seven canned items, despite the fact that at the retail level this difference is not especially outstanding. The apparent explanation for the wider spread on frozen foods at wholesale is found in the higher cost of storing, handling, and delivering such commodities.

Transportation

Transportation of canned and frozen fruits and vegetables from processing plant to wholesale distributor is a major item in accounting for the margins between grower and consumer.

For the canned foods included in the study, the percentage of retail price required for transportation ranged from 4.8 on green beans to 13.1 on cling peaches. The same spread computed for the frozen foods varied from 3.1 percent on baby lima beans to 6.9 percent on peaches.

Processing and Raw Product

Peters found that more than half of the consumer dollar spent is absorbed by processing costs and returns to the grower for the raw product. The percentage ranged from 62.6 percent on frozen peaches to 72.3 percent on canned tomatoes.

A study is now being conducted which has as its aim the determination of average processing costs in 1948 and 1949 for each of eleven items on which margins data are available.

The cost break-down to be established will include some ten major accounting classifications such as raw products, containers, direct labor, indirect operating costs, shipping cases, freezing and storing, gross profit, etc. Findings are again to be expressed in terms of percentage of retail for the 1949 season. In this way, Peters points out, it will be possible to tie those findings directly to the average margins above the processor level which are the subject of his first report.

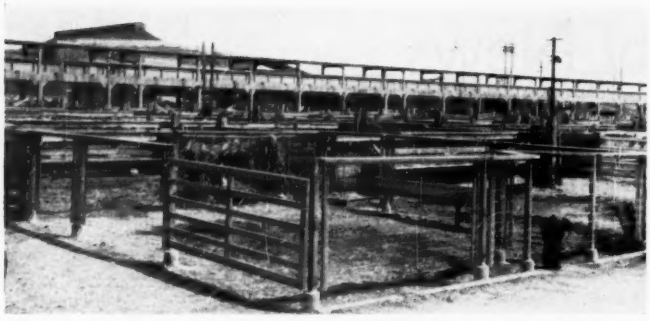
Shortening Use Increases As Lard Use Drops

Over 60 percent of consumer expenditure for lard and other shortening is now for hardened vegetable oils and beef fat. In the first part of 1950 only 38.5 percent of the retail value was for lard. This indicates the continuance of the shift which has been going on for nearly 30 years.

The actual supply per capita of lard has declined gradually, though not steadily, by about a quarter of that typical of the early 1920's. During the same period the alternate shortenings have doubled in per capita supply. During the same 30 years, the retail price of lard has varied somewhat, trending upward slightly. But the price of other shortenings has increased substantially, averaging in recent years about 50 percent higher per pound than at the beginning of the period, without cutting back on usage significantly.

Texas Food Plant

Kraft Foods' new plant on the outskirts of Dallas, Tex., was recently put into operation. It was designed to meet both present and future production requirements and to house the company's division offices and the Dallas sales staff.



Bully Cattle Pen

This all-stainless steel pen experimentally installed at the Chicago Union stockyards is expected to solve a big problem now posed by the wooden pens—maintenance. In addition the pens give an unobstructed view of the cattle.

Committee Gets Moving On Chemical Check

Early September saw the announcement of the appointment of Vincent A. Kleinfeld as chief counsel of the House of Representatives select committee to investigate the use of chemicals in food products. Rep. James J. Delaney (Dem. of N. Y.) is chairman of the committee. Mr. Kleinfeld has been lent to the committee by the Department of Justice, where he is in charge of litigation under the Federal Food, Drug & Cosmetic Act.

Hearings by this committee "will be held in the near future" according to a Sept. 3 announcement of Chairman Delaney. The effects and use of chemicals in the production of foods and the effects of insecticides and chemical fertilizers on food are the announced purposes of the investigation. Congress has appropriated $30,000 to finance the committee.

Membership on the committee includes, in addition to Chairman Delaney, Democrats: Thomas G. Abernethy (Miss.), E. H. Hedrick (W. Va.) and Paul C. Jones (Mo.); and Republicans: Frank B. Keefe (Wis.), A. L. Miller (Neb.) and Gordon L. McDonough (Calif.)

Security Agent Questions New Bread Standards

In a dramatic demonstration that it is possible to bite the (federal) hand that feeds him, an expert on the Federal Security Agency-sponsored Conference on Ageing called FSA's action on bread standards counter to the interests of older people.

Speaking on the bread standards recently published in the *Federal Register*, Clive M. McCay of the Cornell Univ. School of Nutrition said that part of FSA's standards for bread represent gross mistakes and will set back the improvement of the food supply of the older group.

FSA's Food & Drug Administration has set the upper limits for soy flour at 3 percent and yeast at 2 percent.

"Bread formulas for general use may be desirable with levels of these ingredients at much higher levels," McCay said.

"Bread made with 6 percent soy flour, chiefly to benefit the thousands of older people in the mental hospitals of New York State, will be illegal if made and sold in interstate commerce.

"These attempts of the Food & Drug Administration to prevent the use of certain levels of wholesome natural foods in bread seem far beyond their authority and counter to the interests of the aged," McCay asserted.

USDA Engages Consultant To Study Animal Fats

Because of the large surplus of both edible and inedible animal fats and the need for information on the kind and amount of research being done in that field, the Department of Agriculture has entered into a contract with John W. McCutcheon, a private industrial consultant in New York City, to make a survey and appraisal of research and research accomplishments over the past 20 years in the field of animal fats, and to make recommendations regarding the directions of future research.

The United States is self-sufficient in most fats and oils, except for some of the special purpose oils, such as coconut, palm, castor and olive oils. With a consumption of 10,000,000,000 lb. and a production of about 11,500,000,000 lb. of fats and oils annually, the U. S. needs a market for around 1,500,000,000 lb. The domestic consumption of animal fats has lagged far behind production for a number of years, and it is estimated that in 1950 the surplus of animal fats alone will be about 400,000,000 lb. Since many of the foreign countries that would like to buy U. S. fats are not in a financial position to do so, it becomes necessary for this nation to look for other outlets, particularly in the industrial field.

Under the terms of the 12-month contract, Mr. McCutcheon will interview approximately 150 industrial and research organizations to find out the nature and extent of past and present research in the field of animal fats. Some of this will be accomplished by personal interviews and some by questionnaires.

Earnings Hold Their Own Despite Sales Drop

Earnings held up amidst declining sales in at least two of the annual reports appearing in late summer.

With a general declining trend in both sales and earnings, Best Foods, Inc. came up with a whopping 45 percent increase in its net despite a drop in volume. For the year ending June 30, the company reported sales of $78,088,697 compared with $90,176,629 for the previous year. Earnings, however, came to $6,835,950 compared with $4,705,576.

Closer to the general trend, Stokely-Van Camp reported sales of $95,518,201 for the year ending May 31, compared with $95,037,212 for the year before. Earnings were $2,223,614 compared with $2,979,576.

Colorado Milling & Elevator Co. dropped nearly $10,000,000 in sales and close to $1,000,000 in earnings. For the year ending May 31 it reported sales of $83,001,200 compared with $93,158,274 for the previous year Net income dropped to $545,335 from $1,451,641 the year before.

Reports for the first six months of 1950 showed National Dairy Products Corp. with a moderate decline in sales with a total of $440,985,392 against $456,218,089 for the same 1949 period. Earnings, on the other hand, increased to $17,587,399 from $16,537,423.

Ward Baking Co. revealed a slight reversal from the general picture for the first six months, with sales of $41,863,468 compared with $40,754,684 in the same period a year ago. Earnings were $1,130,681 as against $1,430,203.

Borden Co's. six month estimates show slight declines in both sales and earnings. Sales totaled $295,897,609,

compared with $305,047,723 the previous year. Net profit for the period is estimated at $9,850,000 compared with $10,200,000.

In a brief statement Armour and Company announced a nine month's profit of $12,892,000 compared with a loss of $6,342,000 for the same period last year.

How Big to be T-H Baker? It's Getting Confusing

How big does a bakery have to be before the National Labor Relations Board will apply the Taft-Hartley law?

It was all cut and dried until recently. Last year in the Sta-Kleen Bakery case, the Board refused to assert jurisdiction. It said that a bakery is essentially a local business. This climaxed a series of decisions in which the Board took a similar position.

Now it has deviated from the Sta-Kleen position. It took jurisdiction and ordered a bargaining election in McGough Bakeries Corp., Birmingham, requested by the CIO Bakery Workers Union.

There is this difference in the amount of business the two companies do. Sta-Kleen bought $428,000 worth of materials out-of-state. It sold $900,000 worth of products, all within the state. McGough bought materials worth $650,000 in interstate commerce, and sold products valued at $5,000,000, also all inside the state.

Close connection with an interstate organization may have tipped the balance this time. McGough has a $25,000 a year contract with a Chicago firm for a trade name, advertising matter and other services.

Chairman Paul M. Herzog dissented, arguing that the Board should stick to the Sta-Kleen decision and refuse to handle the case.

Large bakeries can no longer be sure that the Board will not apply the Taft-Hartley Act to them.

"THE BONES, HERZOG, WE USUALLY REMOVE."

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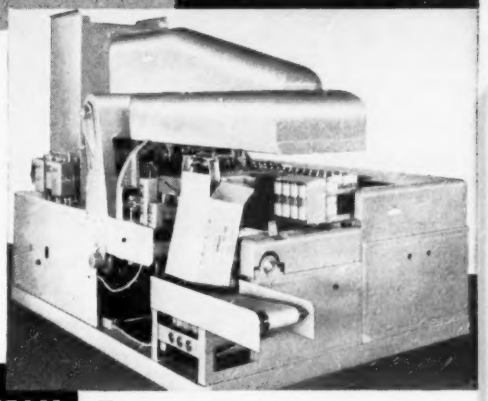
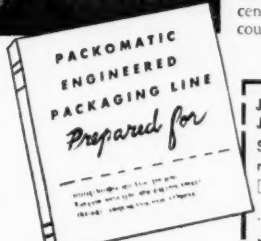
Paper Shipping Cases Opened, Filled and Sealed . . . Automatically

PACKOMATIC automatic shipping case loader with gluer-sealer, (*above*), takes round or rectangular packages, assemblies and loads them into previously squared and registered end-opening shipping cases.

PACKOMATIC fully-automatic shipping case opener-loader, (*right*), forms containers and positions them for receiving assembled packages, then discharges cases, ready for gluer-sealer.



COMPLETELY AUTOMATIC PACKAGING production line to loading dock PACKOMATIC ENGINEERED



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FOR that *increased output* needed to meet continually increasing costs, PACKOMATIC now offers *completely automatic packaging*—production line to loading platform. PACKOMATIC's automatic Paper Shipping Case Opener—Case Loader Units, open and load up to 20 cases per minute, depending upon speed of packaging line. Either unit is available for use separately.

Additional PACKOMATIC equipment includes carton forming and filling machines; volumetric fillers, paper tube equipment and a variety of shipping case gluers and sealers. PACKOMATIC speeds America's great brand names to market. PACKOMATIC's quarter-century experience is yours for the asking. Use coupon below; no obligation!

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Send information about automatic cartoning machinery ☐ shipping case loading ☐ sealing ☐ imprinting machinery ☐ for.....*

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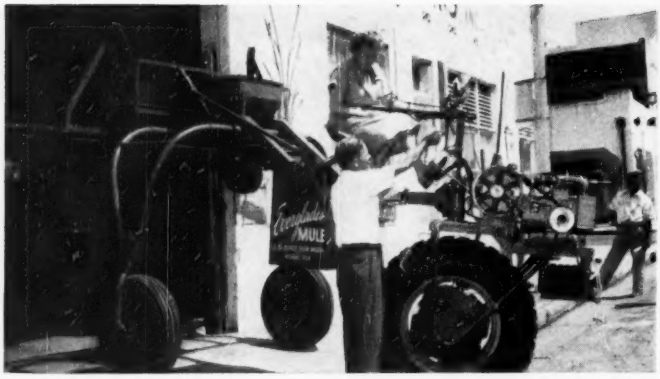
CITY:..... STATE:.....

* Indicate product here.



Tall Corn Mule

Designed for use in fields of tall crops, which might be damaged by conventional tractors, this job was produced at the Dykes Iron Works, in Miami, Fla., in cooperation with University of Florida Experiment Station. Here two Dykes officials look over one of the early 10-horsepower models. (Wide World.)

Shippers Having Trouble With Bigger Eggs

Hens are laying bigger eggs and creating havoc among the egg-crate makers. As a result of scientific breeding and selection, poultrymen have been supplying eggs that now average larger than they used to be. This will continue, Department of Agriculture reports, because of market premiums for larger eggs.

But it's giving trouble to shippers. A standard egg case has been cut to strict dimensions so that a case from one manufacturer would pile beside or upon a case from another maker and make exactly uniform stacks that stow evenly in a truck or freight car.

The larger eggs are crowded in the cases and losses running as high as $48 per carload have been reported.

USDA's Production & Marketing Administration measured more than 16,000 eggs recently, and proved that increases in length and diameter of the eggs were responsible for the breakage.

With the cooperation of various organizations, plans have been worked out for slight changes in the packing materials. USDA recommended that the height of the egg case be increased $\frac{1}{2}$ in.

USDA says that practically all egg marketing interests have accepted its recommendations. But the change-over to new crates will involve some inconveniences and will take time.

In the meanwhile, both styles will be used. Flats and fillers—the paper divisions—have been modified to give the eggs slightly more space. The new style filler can be used in either the old or the new cases. The new style flats can not be used in the old cases. During the transition—while the old cases are wearing out—packers will have to keep two styles of flats, one to use in old cases, the other in new cases.

Cheese Promotion Program Supported by ADA

Ideas on how to sell more cheese were exchanged by the nation's leading cheese manufacturers, distributors, retailers, related food companies and the government at a giant rally sponsored by the American Dairy Assn. and the National Cheese Institute, in Chicago, Aug. 17. Purpose of the rally was to launch the 3rd annual Fall Cheese Festival, a phase of the ADA's $3,000,000 merchandising and advertising program to provide market absorption of 7,000,000,000 lb. of surplus milk.

Owen M. Richards, general manager, American Dairy Assn., Chicago, reported that in addition to advertisements sponsored by ADA and by individual cheese manufacturers and distributors, support will be given the festival by related food organizations, including National Biscuit Co., General Mills, Inc., and George A. Hormel & Co.

John I. Thompson, assistant administrator, Production & Marketing Administration, U. S. Dept. of Agriculture, told the group that the amount of cheese in government stocks can soon become alarming. Main channel of disposal for these stocks, he said, is through distribution to selected schools and institutions. Present Commodity Credit Corp. regulations do not permit repackaging into smaller units or transporting to recipients. An amendment correcting this and allowing for wider distribution of the cheese is now being proposed.

G. W. Diehl, national butter and cheese departments, Great Atlantic & Pacific Tea Co., Chicago, addressed the group from the buyer's standpoint. He pleaded for maintaining high quality and voiced the opinion that, "Poor quality never encouraged continued acceptance." According to Diehl, some bleu cheese currently being sold is not fully ripened, and imitation edams and goudas are also being sold that "will not do the public any good." He decried the loosening up of grading laws on domestic Swiss, and, for clarification, he suggested that the government come out with new cheese definitions.

Speaking for manufacturers of related food products was J. Sidney Johnson, merchandising manager, National Biscuit Co., Chicago. He said, his company is going all out to promote combination selling of "Cheese 'N' Crackers." It will unleash a powerful advertising program to persuade people to serve cheese with Premium Crackers this fall. Arthur Godfrey will remind his 40,000,000 listening audience to buy and eat cheese and crackers. Outdoor posters with the caption 'Dreaming of Cheese' will appear from coast to coast. Other possible tie-ins with the cheese festival include pineapple and cottage cheese, apple pie with cheese, and cheeseburgers.

Lysine-Fortified Bread Tested by Chemists

Rats fed on bread fortified with synthetic lysine were found to grow at a substantially greater rate than control animals fed on the same type of bread without added lysine, it was reported by Hans R. Rosenberg and Edward L. Rohdenburg, of E. I. du Pont de Nemours & Co. "Also," said Dr. Rosenberg in presenting the paper before the division of agricultural and food chemistry of the American Chemical Society, "rats receiving the basal bread diet never attained weights equal to the weights of the animals receiving additional lysine".

Lysine is one of the eight amino acids which, because they serve as "building blocks" in the growth of muscle, nerve, and other body tissues, are essential to human nutrition. In the human or animal body, the speaker explained, proteins from various foods are broken down chemically into their respective amino acids. These molec-

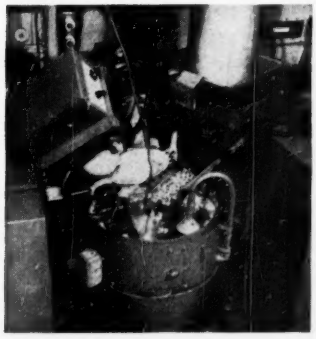
ular building blocks are absorbed, circulated in the blood stream, and re-synthesized into the proteins which comprise various body tissues. Wheat protein is known to be relatively low in lysine, and, as a result of milling, the proteins in wheat flour are even more deficient in this necessary amino acid. Experiments showed that synthetic lysine added to flour undergoes only small losses when baked in bread.

"A diet comprising adequate amounts of meat, milk, cereals, eggs, and bread contains all the lysine needed to insure proper nutrition", Dr. Rosenberg said. "The promising results obtained with rats nevertheless suggest that bread fortified with synthetic lysine deserves serious consideration if it should ever become necessary to improve human nutrition by an increased intake of this essential amino acid."

Most Varieties Included In Cheese Standards

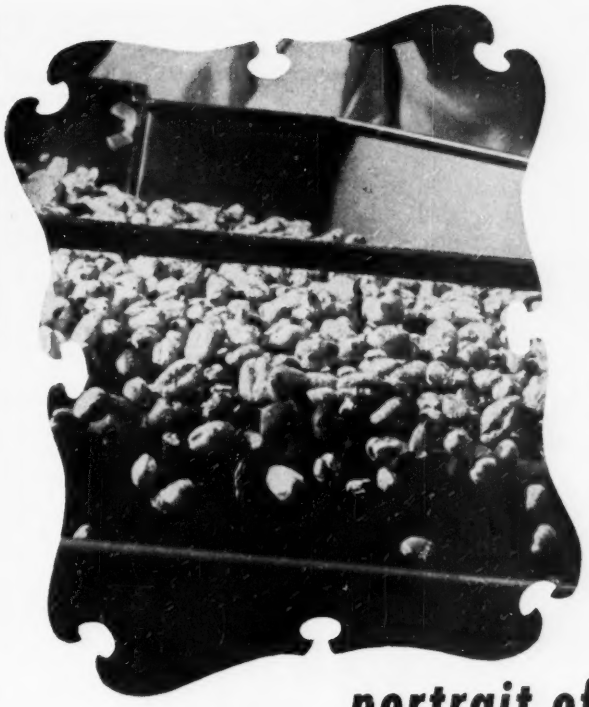
Most of the new cheese standards promulgated by the federal government in August will go into effect 6 months from then. They provide specifications for the composition of various cheese products and require more informative labels. The most important single requirement, however, is the provision that any cheese not made from pasteurized milk must be held for 60 days before being offered for sale.

The new cheese standards amend the present regulations for cheese and cover many varieties of cheese not now standardized: Brick, limburger, munster, blue, gorgonzola, roquefort, and



More Quality Control

Electric eye at Seabrook Farms selects peas and lima beans for freezing. The "off-color" vegetables are knocked off the line automatically. Application here is notable chiefly as the first use of the photo cell in the selection of wet vegetables. (Wide World)



portrait of a profitable phenomenon

"Separation by specific gravity through air-flotation" – not a rare scientific event, but a standard food processing procedure!

Day in, day out, in hundreds of plants – tons of dry agricultural products pour off the decks of Sutton Specific Gravity Separators and Air-Float Stoners installed throughout the food processing world.

No other type of equipment can match the famous S S & S Process for profitable and effective solutions to the problems of minimizing hand-picking; of applying more infinite control over cleaning and classifying methods; and of reducing product shrinkage when it is necessary to process "off-grade" materials.

Interested? Contact the S S & S product engineer nearest you – or, write for free illustrated literature. (See coupon below.)

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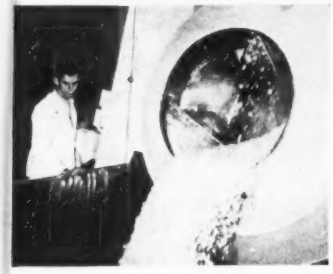

Now you can do more mixing in less time—with the Worthington-Ransome Rotating-Tilting Pan-Type Mixer.

The drum is not only motor-*rotated* . . . it's also motor-*tilted*. Push-button tilts drum to any angle while rotating —materials discharge *completely*, with no nuisance of scooping.

Capacities up to 3000 lb. reduce handling and re-handling and increase output.

Widely used for coating, coloring, tumbling, polishing and finishing on candies, gum, drug tablets, etc.—mixing powdered milk, relishes, dry gelatin, etc.

Write for Bulletin R-708 on Worthington-Ransome Mixers, built from designs developed from nearly a century of mixer experience.

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many less well known. Percentages of moisture and fat are specified for each variety.

The new standards also cover pasteurized process cheese, cheese foods, and cheese spreads. In addition, there are "cold pack cheeses" which under the new standards will be required to be made of pasteurized or aged cheese.

The Food & Drug Administration will enforce the new standards. The agency pointed out that if consumers learn the basic differences in the various types of cheese "they can buy intelligently."

The cheese industry and the F&DA worked together for several years in developing the standards. In announcing the new standards, Federal Security Administrator Oscar R. Ewing said that without the full cooperation given by the cheese industry, it would have required several years longer to gather the necessary data.

Can Use Shale-Oil Wax In Carton Coating

Future market demands for paraffin waxes for coating food containers can be partly met by waxes processed from oil shale, the U. S. Bureau of Mines reports. Oil shale is petroleum-bearing rock found in the West.

Bureau technologists at the Laramie, Wyo. Petroleum & Oil-Shale Experiment Station and the oil-shale demonstration plant at Rifle, Colo., collaborated in producing waxes from shale-oil distillates.

Fully refined shale-oil wax is virtually identical with the fully refined petroleum variety. The cost of making the crude and semi-refined grades will be about the same as in making petroleum paraffin wax. But the cost of making a fully refined shale-oil wax will be somewhat higher than for fully-refined petroleum paraffin.

However, in case of war, for example, the shale oil wax would provide material for coating paper and other containers used for milk and other food products.

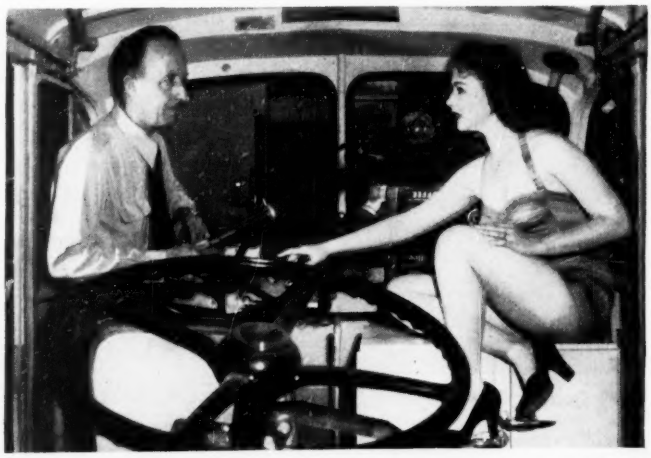
Mayonnaise Standards Go Into Effect

After November 12 mayonnaise or mayonnaise dressing, french dressing, and salad dressing moving in interstate commerce must comply with standards of identity and labeling requirements issued under the Federal Food, Drug & Cosmetic Act.

The standards are based on public hearings held from Nov. 17, 1947 to Jan. 13, 1948.

The Food and Drug Administration outlines the official requirements as follows:

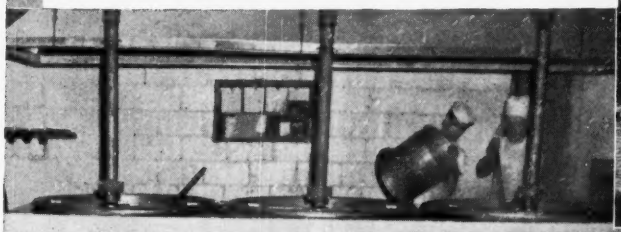
All of the aforementioned foods must contain a specified minimum of vegetable oil—mayonnaise 65 percent, french dressing 35 percent, and salad dressing 30 percent. Mineral oil is not permitted. Label statement of the specific vegetable oils employed is not required.



Movie Milkwagon

You will soon be hearing of a movie called "The Milkman" in which this trick wagon appears, dummy steering wheel and all. Other things in this truck not usually found in a milkwagon are the coffee maker and Piper Laurie, who has a part in the picture. And furthermore, no one is paying for this ad. (Wide World)

Batch cooking fruits and other pie fillings in steam kettles heated by central Sellers Gas-steam Boilers.



Reed Gas-fired Tunnel Oven used for continuous baking of covered pies.

FOOD PROCESSING OPERATIONS AT

The Real Pie Bakers

THE ONLY PIES

DEMONSTRATE VERSATILITY OF GAS

Filling open-type pie shells as they rotate in Gas-fired Fish Rotary Oven.

A MILLION PIES would be something of a record for any bakery, but it's only part of the total prepared during the last 25 years in the Gas Ovens of THE REAL PIE BAKERS, Pittsburgh, Pennsylvania.

Actually, pie-baking is only the final step in a series of food processing operations in which GAS plays so important a role. Then, after the products are on their way, this same fuel, and modern Gas-fired Equipment, take over the jobs of cleansing and sanitizing.

In the preparation of fruits alone the importance of GAS is emphasized by the 40,000 bushels of apples and 500,000 pounds of fruits and berries processed during 1949. Cooking vats supplied with steam from Sellers Gas-fired Boilers are used for this purpose—and steam proof boxes are also served from this source.

Baking is performed in a Reed Tunnel Oven and three Fish Rotary Ovens. Filled and glazed donuts are deep-fat fried in a Gas-fired Vitamatic Donut Fryer.

Food processing with GAS is the modern, efficient way to obtain uniform results and THE REAL PIE BAKERS have taken full advantage of the versatility of GAS by applying it to their wide variety of heating requirements.

GAS will serve you just as efficiently and economically—and your Gas Company Representative will show you how.

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Plates, Structurals, Bars, Sheets, Tubes, etc. . . . Carbon, Alloy and Stainless Steels . . . .

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VICTOR 475
Food Conveyor Belting

The thorough, fiber by fiber Neoprene impregnation of this belting is responsible for its successful resistance to vegetable, mineral, and fruit acids and oils . . . simply cannot pick up odors or small particles. To clean . . . use boiling water or steam. It's tough . . . resilient . . . built right to meet the rigid requirements of the food processing industry. For trouble free service and long-term economy, specify Victor 475 Food Conveyor Belting.

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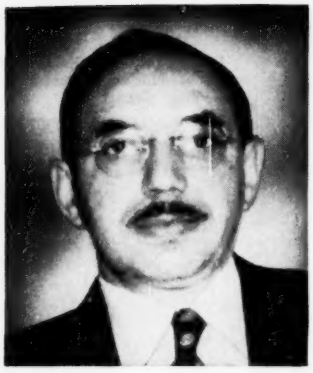


Gets Chesterman Award

S. S. Epstein, Kirsch Beverages, Brooklyn, N. Y., is one of recipients of this year's Chesterman Award, made by American Bottlers of Carbonated Beverages, for outstanding contribution to the industry. Sharing the award with Dr. Epstein was Mooson Kwauk, Coca-Cola Export Corp., Bombay, India.

Vinegar, lemon or lime juice may be used in dressing. Citric acid as such, may be used with vinegar but the quantity is limited to 25 percent of the acetic acid in the vinegar. If citric acid is used, the label must say so.

Spices, monosodium glutamate, and harmless food seasoning or flavoring are permitted, except for any that impart to mayonnaise or salad dressing a color simulating egg-yolk color. Tomato paste and puree, catsup, and sherry wine are optional for french dressing.

The dressings may all be seasoned with salt, sugar, sirup or honey.

The emulsifying agent for mayonnaise is limited to liquid or frozen whole eggs or egg yolks, or a mixture of any of these with liquid or frozen egg white.

French dressing may be emulsified by not more than 0.75 percent, by weight, of the following optional ingredients: Gum acacia or gum arabic, carob bean gum or locust bean gum, guar gum, gum karaya, gum tragacanth, extract of Irish moss, pectin, propylene glycol ester of alginic acid, sodium carboxmethylcellulose, egg yolk, or any mixture of these.

Salad dressing should contain not less than the equivalent of 4 percent liquid egg yolk and a cooked starchy paste prepared with food starches or flours to which water may be added. It may also contain more than 0.75 percent of the optional emulsifiers permitted in french dressing, if the label declares such addition.

The Food & Drug Administration

says the name "mayonnaise salad dressing" is not permitted because it would tend to cause purchasers to confuse mayonnaise and salad dressing.

Former Hershey Head Taken by Death

Death took another food pioneer with the passing of William F. R. Murrie on Sept. 7, at the age of 77. As president and general manager of the Hershey Chocolate Corp., Mr. Murrie was credited with popularizing the chocolate bar. Starting with the company as a salesman, he advanced rapidly, becoming general manager before he was 30 years old, and president when the plant was moved to Hershey, Pa., in 1903.

Retiring in 1947, Mr. Murrie left a long string of accomplishments in the confectionery field. He was the first president of the Cocoa & Chocolate Manufacturers Assn. of the U. S., and a member of the New York Cocoa Exchange. In retirement he retained an active interest in company enterprises as a member of the board of directors of the Hershey Industrial School, the Hershey National Bank and the Hershey Trust Co.

F&DA Ice Cream Hearings Resume in November

After a lapse of eight years the Food & Drug Administration will reopen hearings on ice cream and other frozen desserts on Nov. 13.

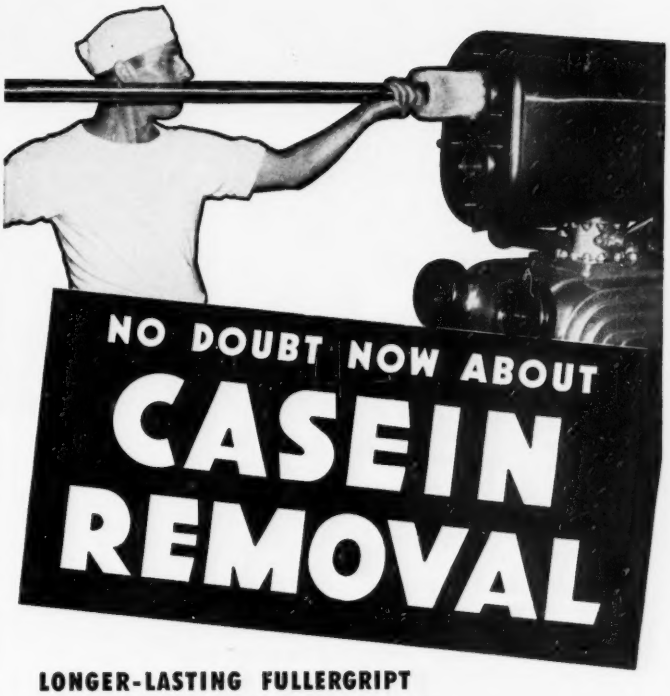
Federal Security Administrator Oscar R. Ewing said the hearings are being reopened to give interested parties an opportunity to present further evidence for use in the formulation of definitions and standards of identity for these frozen foods.

Initial hearings were held early in 1942, but standards were not announced because of the war which restricted use of some raw materials used in their preparation.

Standards for ice cream are set by the different states. The only federal requirement, contained in the Federal Food, Drug & Cosmetic Act, calls for purity of ingredients and avoiding misleading practices.

Administrator Ewing said that because of increasing interstate commerce in frozen desserts, "the industries concerned need a 'yardstick' so that uniformity in terminology for various frozen products may be attained, and the consuming public can know exactly what it is purchasing."

Three days before he made announcement of the hearings, the Administrator reminded the ice cream manufacturing industry that the Food & Drug Ad-



LONGER-LASTING FULLERGRIPT BRUSH SPECIALLY BUILT FOR FAST CLEANING OF ICE CREAM FREEZER

For all the scrubbing of the freezing cylinders of the machines at one well known ice cream plant, where a brush was worn out every month, the foreman was not satisfied cylinders were scrubbed clean. He had to be certain all incipient deposits of casein were removed.

The problem was put up to Fullergript engineers — who set themselves to designing a new kind of brush from Fullergript strip ... that versatile product with brush material continuously anchored in a metal channel, one which can be fashioned into most any shape. Using this brush strip — filled with white nylon filament to take heavy punishment — the engineers coiled it with a forward tilt around a shaft. Consequently, when this brush is run into a cylinder, the pressure is *against* the direction in which brush material normally lays. An unusual scouring action results.

This special Fullergript brush cleans a freezing cylinder in five to ten strokes, and cleans it to everybody's satisfaction. Instead of wearing out in a month this brush has now lasted eighteen months, and is still considered in excellent condition. It saves labor, assures sanitation, and brings economy through its longer life.

DO YOU REQUIRE A SPECIAL MACHINE FOR A BRUSHING OPERATION?

You can benefit from our wide experience in designing and building special brushing machines. No obligation to lay your problem before our engineers.

This is typical of the many special Fullergript brushes that have been developed for the food industry. Similar services are available to you without obligation. For further information write for our booklet "Fullergript Power Brushes".

FULLERGRIPT The FULLER BRUSH CO.

INDUSTRIAL DIVISION
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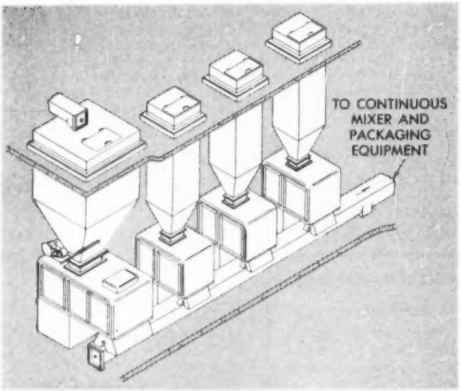
Blend Foods CONTINUOUSLY

the OMEGA way

A prepared-mix plant feeds and blends from two to eighteen ingredients automatically . . . continuously . . . with the Omega Feeders shown above. A large cracker bakery uses Omega Feeders for weighing and blending flour. Omega Feeders add the propet amount of sugar, salt, etc. for canned apple sauce — salt for seasoning canned tomato juice. These are but a few of the many food blending jobs being handled the Omega way . . . the modern way of mixing and proportioning foods automatically. Use Omega Gravimetric Feeders and be assured that every package or can of your product goes to market with the same high quality. For complete information and descriptive Bulletins, address Omega Machine Company (Division of Builders Iron Foundry), 402 Harris Ave., Providence 1, R. I.



Typical installation of Omega Belt-Type Gravimetric Feeders for proportioning and blending flour, salt, soda, and V-90 phosphate to make self-rising flour.

Omega manufactures a complete line of volumetric and gravimetric feeders for dry materials and for gravity feeding of liquids and solutions:

Belt-Type Gravimetric Feeders
Loss-In-Weight Gravimetric Feeders
Universal Feeders
Precision Solution Feeders
Disc Feeders
Rotodip Solution Feeders
Rotolock Feeders
Dust Collectors
Bucket Elevators

THE LAST WORD IN FEEDERS
OMEGA

ministration continues to consider ice cream containing vegetable fats in the place of milk fat "adulterated within the meaning of the Federal Food, Drug & Cosmetic Act, and therefore subject to action under the law."

The setting for the recent action on hearings was laid last April when the Federal Security Administrator issued an "interpretation statement" on ice cream.

He declared at that time: "The Federal Security Agency has received a number of inquiries regarding proposals to market in interstate commerce a frozen product made in semblance of ice cream, but containing vegetable fats in complete or partial substitution for milk fat. It has been stated that the product is being currently manufactured in several states for distribution wholly within the borders of the state in which it is made.

This agency regards the products of this type, in which any vegetable fat is used as an ingredient, as adulterated within the meaning of the Federal Food, Drug & Cosmetic Act, and therefore subject to action under the law.

An investigation of the practice was made during the past few months. In a few cases, it is reported, federal agents found interstate shipments of frozen desserts containing vegetable fats. The Federal Security Agency reports that criminal prosecutions are now being prepared.

Food Liaison Group

Names of the national trade association executives who have accepted appointment to the Defense Liaison Committee of The Food Group in Washington were recently announced. The organization of representatives of most of the national food and related industry associations located in the nation's capitol, The Food Group authorized a special committee of its members to work with government agencies on specific problems of manpower and selective service, as well as developments or problems arising from the Defense Production Act of 1950.

The names of the defense liaison committee members of The Food Group are as follows: Watson Rogers, Chairman, National Food Brokers Assn.; M. H. Brightman, Dairy Industry Committee; Benjamin F. Castle, Milk Industry Foundation; William H. Doherty, Hawaiian Sugar Planters Assn.; Wallace Flint, National Assn. of Food Chains; C. B. Heinemann National Independent Meat Packers; William T. Jobe, National Assn. of Ice Industries; William Quinlan, Associated Retail Bakers of America; C. W. Kitchen, United Fresh Fruit & Vegetable Assn.; Harold O.

Smith, Jr., U. S. Wholesale Grocers' Assn.; Joe R. Cavanagh, Ex-Officio (Vice Chairman, The Food Group); William Dalton, National Assn. of Refrigerated Warehouses; Joseph B. Danzansky, Mayonnaise & Salad Dressing Manufacturers Assn.

German Tinplate Short

Shortage of tinplate may prevent factories from canning part of the Bavarian vegetable crop, it is announced by the Bavarian Ministry of Economics. This applies particularly to cucumbers, as harvesting has begun earlier than usual.

The Bavarian Ministry of Economics has asked the Federal Economics Ministry to request tinplate producers to defer execution of export orders in order to meet domestic needs first.

For Food Processors

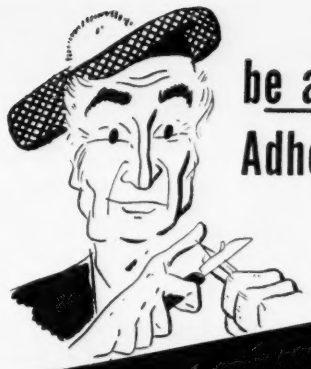
New York State Experiment Station, at Geneva, has scheduled its third annual food processing meeting for Wednesday, Nov. 15th.

The meeting is sponsored by the Division of Food Science and Technology at the experiment station and the program is designed primarily to review progress in the station's food research. All research personnel of processing and related industries are cordially invited to participate in the conference.

Details of the program will be announced later, but present plans call for presentation of results of fundamental research in progress at Geneva on food processing, including some of

Ice Cream Vendor

Going American Good Humor men one better, this ice cream dealer does a rush business among the swimmers on the Main River, in Frankfurt, Germany.



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CASTERS • • LIFT JACK SYSTEMS • • INDUSTRIAL TRUCKS

the current studies on frozen foods, tomato products, and a variety of other investigations in food preservation.

F&DA Food Seizures Continue Small

Recent figures of the Food & Drug Administration show that the government enforcement agency is seizing an average of three shipments of unfit and misbranded food per day. It is obtaining court convictions on slightly less than one-third of the seizures.

During June, for example, F&DA seized 65 interstate shipments of food on charges of failure to comply with the Federal Food, Drug & Cosmetic Act. During the same month the government bureau obtained 26 convictions in court prior to seizures.

In July F&DA seized 63 shipments of food, and obtained 12 convictions on seizures made prior to July.

Correction

The caption on page 59 of our July issue took Charles L. Smith away from Continental Can Co., crediting him to American Can. Inasmuch as "Chuck," Continental, and most of the canning industry know that he is still very much with Continental, FI would like to reveal that its caption writer knew it, too, but slipped.

F&DA Food Standards

Status of food standards program of Food & Drug Administration in early September is reviewed below.

Future Hearings

1. *Ice cream.* New, resumption of prewar hearing, scheduled for Nov. 13, 1950. Announcement on p. 5112 of Aug. 8 *Federal Register.*

2. *Preserves.* Amendment, requested by industry; announcement expected soon, hearing to follow ice cream.

3. *Canned pineapple and canned pineapple juice.* New, requested by industry, scheduled for Oct. 15, 1951 (postponed from Oct. 1950).

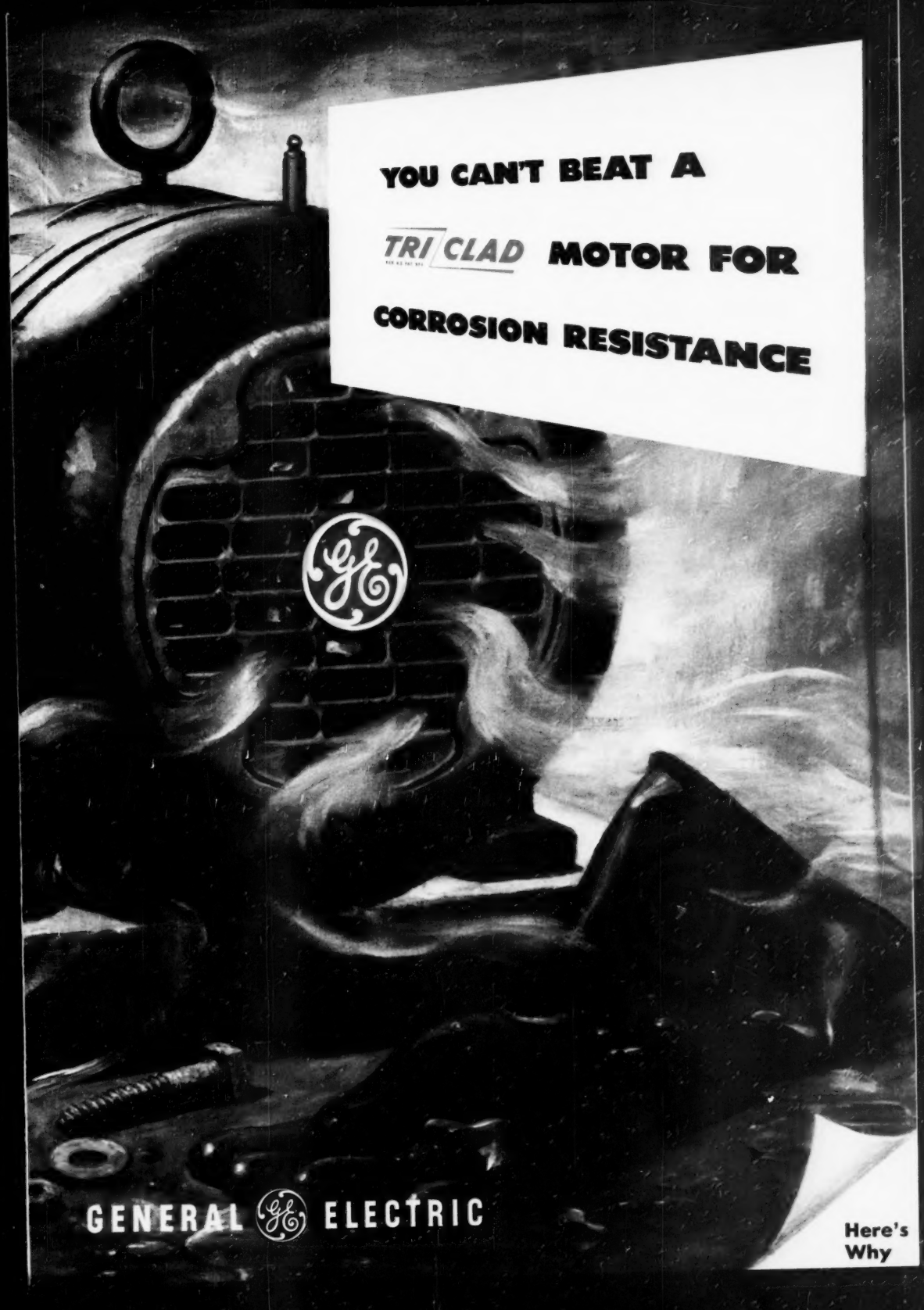
Hearings in Progress

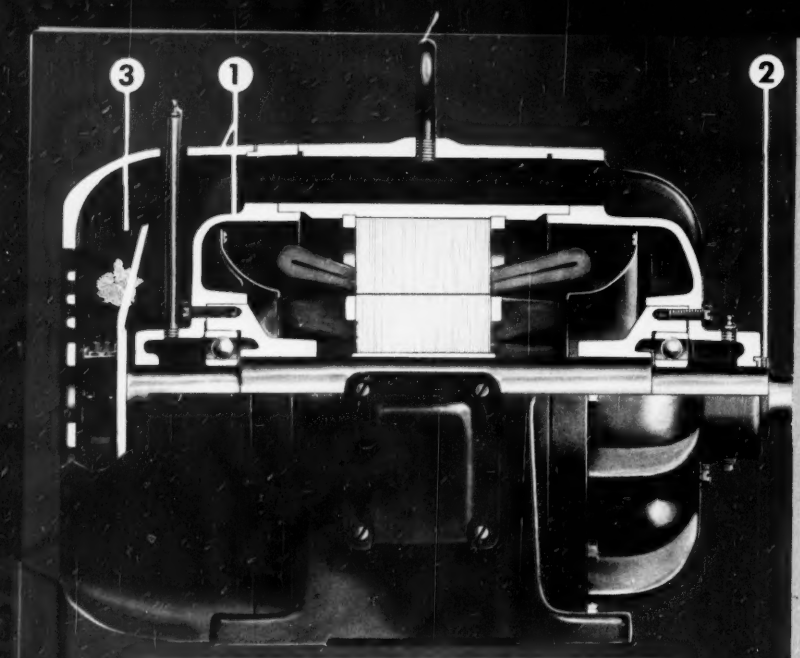
1. *Residue tolerances.* Hearing scheduled to reconvene Sept. 11 and finally adjourn in about two weeks; fluorine residue on apples and pears, additional residue data, and final miscellaneous testimony expected to close hearing.

Tentative Orders Awaited

1. *Frozen Fruits.* Long awaited; hearing adjourned in July 1948, briefs filed in October 1948.

(*Turn to page* 147)


YOU CAN'T BEAT A
TRI CLAD MOTOR FOR
CORROSION RESISTANCE
GENERAL ELECTRIC
Here's
Why



Here's the totally enclosed Tri-Clad double-shell structure (1) that locks out dirt, flying metal chips, abrasive dust and corrosive fumes. Check the rotating labyrinth seal (2) which prevents foreign matter from working in along the shaft. Note the cast-iron housing, the corrosion-resistant G-E Textolite* material cooling fan (3). Fan circulates cooling air between the shells—no contaminated air touches the punchings or inside parts.

You can't beat TRI/CLAD motors for corrosion resistance

Acid fumes, alkali dust, dye-house vapors, tropical weather – you name *your* motor "poison." You just can't beat Tri-Clad cast-iron construction for corrosion resistance.

Rolling up 6 billion hours of service on all kinds of jobs, more than 1,876,000 Tri-Clad motors tell the eye-opening story of cast-iron motor structure. You get an inherent damping action that minimizes noise and damaging vibration. You get rigidity that makes for permanent shaft alignment. (Try bolting a Tri-Clad motor to an uneven surface – the bolt will snap before you can twist the rigid frame out of line.) You get extra protection against jarring blows and rough handling. You get resistance to rust and corrosion that is not approached by any other metal used for standard motor construction today.

WANT MOTORS THAT STAY ON THE JOB ANWYHERE? There's a stock of Tri-Clad motors near you, in nearly all types and ratings, ready for **IMMEDIATE SHIPMENT**. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

*Reg. U. S. Pat. Off.
(standard on popular sizes)

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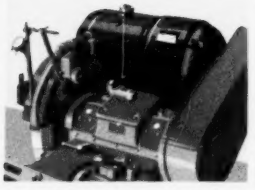
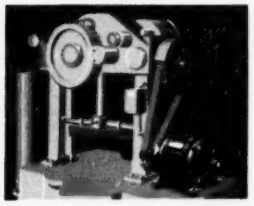
YOU CAN'T BEAT TRI/CLAD EXTRA PROTECTION

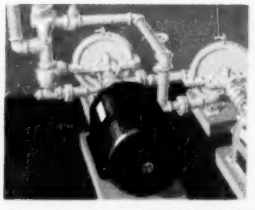
G-E capacitor motors for use on fans, blowers, pumps and compressors with single-phase power. From ¾ to 5 hp.



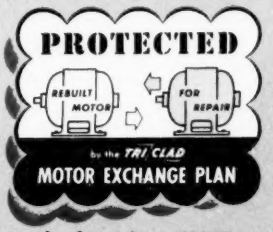
G-E Type ACA induction motors for adjustable speeds—provide speed ranges from 3-1 to 20-1. From 3 to 75 hp.



G-E open (dripproof) induction motors for constant-load, constant-speed applications. From 1 to 2000 hp.



G-E totally enclosed motors for outdoor operation, in abrasive dusts, or corrosive fumes. From 1 to 1000 hp.



Look for this EXTRA on the motor you buy!

2. *Canned mushrooms* (amendment). Expected soon; hearing adjourned in June, briefs filed in July 1950.

Final Orders Awaited

1. *Canned corn.* Expected soon; tentative order published in April 1950.

2. *Cream cheese with (and) other foods; Neufchatel cheese spread with (and) other foods.* New findings of fact and a proposed order were published on p. 5694 of the Aug. 24 *Federal Register;* written exceptions to the tentative order may be filed until Oct. 23.

3. *Bread.* Not expected soon; deadline for filing exceptions to tentative order extended from Sept. 7 to Oct. 9 by order published on p. 5810 of Aug. 29 *Federal Register.*

Standards Completed

1. *Salad dressings.* Final order published p. 5227, Aug. 12 *Federal Register;* effective date Nov. 10

2. *Cheeses.* Final order published p. 5656, Aug. 24 *Federal Register;* effective dates for most cheeses, classes of cheese, processed cheeses, etc., Feb. 24, 1951; effective date for asiago medium cheese, sap sago cheese, and hard grating cheeses May 24, 1951; effective date for parmesan cheese and asiago old cheese Aug. 24, 1951.

3. *Labeling requirements of partly cured cheeses.* Exemption from certain labeling requirements has been granted in the case of cheeses, the curing of which has not been completed, while the cheese is still in the possession of the manufacturer but in interstate movement. This labeling exemption was published on p. 5655 of the Aug. 24 *Federal Register,* and was to be effective Sept. 23.

USDA Grade Standards

Recent actions by Production & Marketing Administration of U. S. Dept. of Agriculture on U. S. Grade Standards and related activities include the following:

Canned lima beans, third revision, proposed, p. 5056, Aug. 5 *Federal Register.*

Milk for use in manufacture of dairy products, new, proposed, p. 5475, Aug. 17 *Federal Register,* written comments received until October 31.

Canned apple sauce, second revision, p. 5495, Aug. 18 *Federal Register,* effective Sept. 17.

Frozen concentrated orange juice, revised, p. 5625, Aug. 23 *Federal Register,* effective Sept. 22.

Bunched beets, second revision, proposed, p. 5635, Aug. 23 *Federal Register.*

Italian sprouting broccoli (consumer standards), new, proposed, p. 5512, Aug. 18 *Federal Register.*

LEE MATERIAL HANDLERS

The Industry's Most Important Development

SAVES TIME, MONEY AND COSTLY MANPOWER

LEE Materials Handler dumping 500 lb., 54 gallon barrel of preserves in 4 ft. high kettles. Other models for specific jobs. Write for Bulletin LM-13.

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Imprinting Code Dates on Frozen Food Cartons

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How do Seabrook Farms and other top frozen food packers put the code date on their packages? With a compact, precision-made ROLACODER attached to the infeed of a wrapping machine. As filled cartons are conveyed through the wrapper a friction-actuated ROLACODER automatically imprints them. Clean, sharp, permanent marks are assured because—for dry-waxed cartons like these—the ROLACODER uses special odorless, lead-free inks. Also, it uses interchangeable type or dies that permit quick, easy copy changes.

Whatever your product or your package . . . there's a place in your line for a labor-saving ROLACODER.

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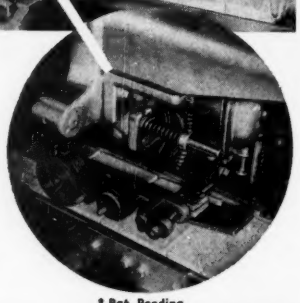

* Pat. Pending

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ADOLPH GOTTSCHO, INC.
MACHINES TO MARK WHATEVER YOU MAKE
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Make all loads...
PAY LOADS!

If PACKAGED FRUITS OR PRODUCE ARE BEING "MANHANDLED" you can use the Buschman TROJAN profitably.

Wherever loading, unloading, stacking or boosting is done, this portable belt conveyor does it faster, easier and cheaper. It can be moved and operated by one man; adjusted for height as desired. Trojan conveys packages up, down or horizontally . . . by itself or in combination with portable or fixed conveyors.

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For complete details, write for Bulletin 50.

Buschman Conveyors

REPRESENTATIVES IN PRINCIPAL CITIES

THE E. W. BUSCHMAN CO., INC.
4475 Clifton Ave. Cincinnati 32, Ohio

Directs Food Course

Kenneth Wilson will direct the curriculum of food distribution recently established at Michigan State College under a grant of $87,500 by a number of interested companies through the National Assn. of Food Chains. Grant is designed to train executives and managers in food distribution.

Apples (consumer standards), new, amendment to Aug. 2 proposed publication, p. 5618, Aug. 22 *Federal Register*.

(U. S. consumer standards "are permissive, not mandatory. They differ from other U. S. grades primarily intended for wholesale use, in that they usually are more rigid in regard to quality, size and cleanliness. Packing under consumer grades requires more sizing and closer sorting." Consumer standards have already been established for husked corn on the cob, potatoes, tomatoes, spinach leaves, celery, carrots, Brussels sprouts, and fresh kale. As indicated above they have also been proposed for Italian sprouting broccoli and for apples.)

QMC Wants Confections

Quartermaster Corps officials are interested in securing at least 15 more types of confections to add to the present selection of over 30 varieties, and candy manufacturers are urged to submit confections which they believe will be acceptable to the members of the Armed Forces. Such confections when submitted to QMC will be subjected to stability and acceptance tests.

Represenatives of the candy industry have recently held several conferences with QMC officials to clarify existing specifications for ration confections, as well as to write additional specifications for confections not heretofore used.

WORTHINGTON REFRIGERATION REPORT

WORTHINGTON PUMP AND MACHINERY CORPORATION
HARRISON, NEW JERSEY

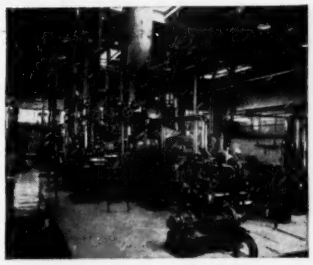
Specialists in air conditioning and refrigeration for more than 50 years

Ice-Making Fuel Cost Reduced by 40%

The Pacific Fruit Express Co. has an ice manufacturing and storage plant at Tucson, Ariz. for servicing perishable produce shipped by rail. This plant operates 24 hours per day and has a capacity of 250 tons daily during the peak season. They can ice 160 cars, 80 on each side of the platform in one spot.

The Worthington LTC-4 Gas Engine-driven Compressor installed at this plant is more economical than the steam-driven compressor it replaced, having reduced fuel cost by 40%.

The Worthington Compressor was installed in April, 1948, and is used for recirculation of ammonia gas in refrigeration plant. This 500 hp, 300 rpm machine runs an average of seven months per year, 24 hours per day and has given trouble-free operation.



Main engine floor showing Worthington LTC-4 Ammonia Compressor driven by a Worthington gas engine.

Nothing Too Good for the Pigs

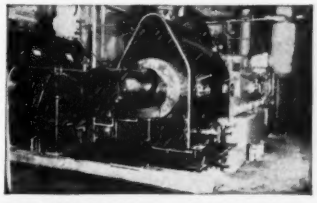
John Morrell & Co.—one of the largest pork meat producers in the world—has always been alert to technical progress. It was the first to wrap hams in parchment paper, first to pack lard in paper cartons, one of the first to install the revolving smokehouse.

When the company decided to increase the general refrigeration capacity of its plant at Ottumwa, Iowa, Worthington equipment was selected on the basis of favorable comparative operating cost figures.

That was over ten years ago, and the Worthington two-stage ammonia compressor is still operating in a highly satisfactory manner, in respect both to operating cost and absence of trouble.

Cold storage room at John Morrell & Co.'s Ottumwa plant.

This compressor operates 24 hours a day with shutdown only during the coldest month for annual overhaul. It provides refrigeration for both freezing and storage (0 to 15 F).



Type ODU Uniflo steam-driven Worthington ammonia compressor.

Fully Automatic Refrigeration for First National Stores

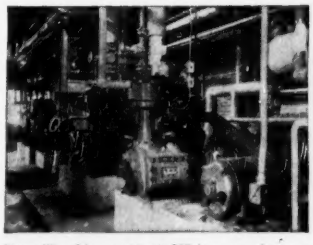
About 300 stores of the vast northeastern network of First National Stores are served by the warehouse in East Hartford, Conn.

This warehouse has recently been expanded by the construction of refrigerated compartments for banana ripening, meat storage and assembly, and cooling of pork products, corned beef and chicken.

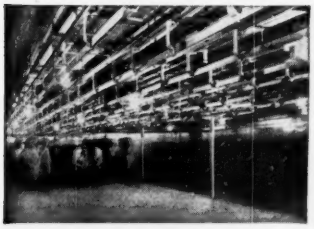
A fully automatic system of refrigeration has been installed. It produces about 80 tons of refrigeration, and includes the following Worthington equipment: four 7 x 7 ammonia compressors, two 16 x 12 condensers, one 12 x 9 condenser, two 16 x 16 brine coolers, one 12 x 9 brine cooler.

There are two levels of brine refrigeration, one at minus 15 F, one at 12 F. Defrosting is done by hot brine in rooms served by pipe coils and by water in rooms served by product coolers.

Architect: Ganteaume and McMullen, Boston. Installation by Harding and Gross, Cambridge.



Four Worthington 7 x 7 VSA ammonia compressors. Condensers in background, brine coolers overhead.

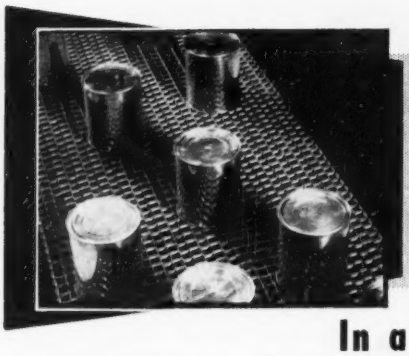


Meat storage room—part of new addition to East Hartford warehouse of First National Stores.

WORTHINGTON

AIR CONDITIONING AND REFRIGERATION

A complete line . . . in which *all* the vital components are made, not just assembled by Worthington. For more worth with Worthington, see your nearby Worthington distributor (consult Classified Telephone Directory).



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In a LA PORTE FLEXIBLE Steel Conveyor Belt . . .

because a La Porte Belt lasts longer, requires less care, is easily and quickly sterilized with steam or scalding water, does not stretch, does not creep, weave nor jump to wear pulley stands, and it is adaptable to every food manufacturing process.

Start saving on your food conveying costs TODAY by installing La Porte Flexible Steel Conveyor Belting.

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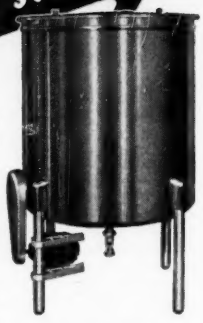
There's a STAINLESS STEEL SAN-I-TANK for every kind of food processing and storage



For example, Type "J" is a single shell tank, available in capacities from 60 to 1000 gallons, that will take standard fittings of all kinds, is especially adapted for storage or mixing purposes.

◊ Type "CHR" is a jacketed tank for heavy or light processing, for cooking or cooling, and equipped with the famous horizontal "wiping action" agitator.

Write today for Bulletin SS-50, which describes Type "J" and other single shell tanks in detail. Write for Bulletins CHR-50 and JS-50 for detailed information about jacketed tanks.

STAINLESS STEEL SAN-I-TANKS
METAL GLASS PRODUCTS COMPANY
BELDING 6, MICHIGAN

Manufacturers wishing to submit confections to QMC for possible inclusion in the rations can send shipment to Dr. Kenneth T. Farrell, General Products Div., Food Laboratories, Quartermaster Food & Container Institute, 1819 W. Pershing Road, Chicago 9.

Flour Mill at College

Installation of milling equipment to be used for study by students enrolled in milling engineering has begun at the Oak Street laboratory of the University of Minnesota engineering experiment station.

Plans, which were developed in cooperation with various flour milling firms and machinery manufacturers, called for limited operation by Oct. 1 of full-scale equipment on a pilot plant basis, according to John M. MacKenzie, head of milling engineering in the University's institute of technology.

The milling engineering curriculum was established at the University in 1947 with the cooperation and financial support of the Miller's National Federation, a trade association of wheat flour millers. The curriculum, which leads to the degree of bachelor of mechanical engineering, provides 40 credit hours of specialized subjects related to flour milling.

Schedule of Events

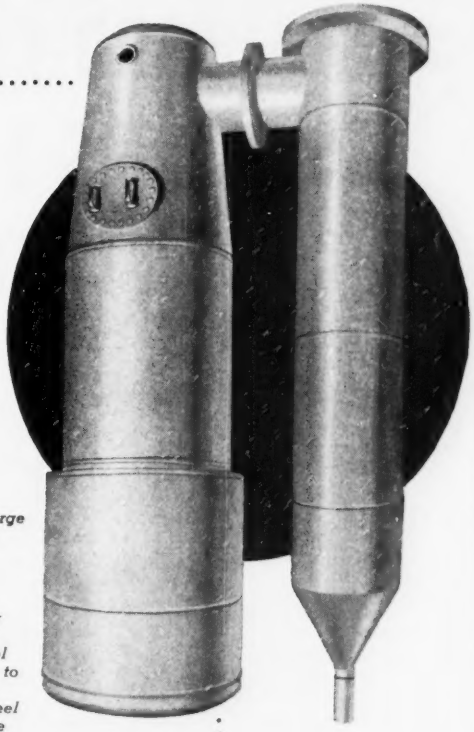
October

1– 4—Tea Assn. Convention; Greenbriar Hotel, White Sulphur Springs, Va.
5–14—National Macaroni Week.
10–12—Society of Industrial Packaging & Materials Handling, 5th annual exposition; Convention Hall, Philadelphia.
13–18—American Bakers Assn., annual convention; Hotel Sherman, Chicago.
15–18—International Assn. of Milk & Food Sanitarians, Inc., annual convention; Hotel Dennis, Atlantic City, N. J.
16–17—Boston Conference on Distribution; Hotel Statler, Boston, Mass.
16–21—Milk Industry Foundation and Dairy Supply Assn., 43rd annual convention and 17th exposition; auditorium, Atlantic City, N. J.
18–20—International Assn. of Ice Cream Mfg., 46th annual convention; auditorium, Atlantic City, N. J.
23–25—Packaging Institute, 12th annual forum; Hotel Commodore, New York City.
25–27—National Assn. of Popcorn Manufacturers, 6th annual convention and exposition; Stevens Hotel, Chicago.
23–28—National Honey Week.

November

13–15—Grocery Manufacturers of America, annual convention; Waldorf-Astoria, New York City.
15–17—Texas Technological College, 2nd annual dairy manufacturers short course; Lubback, Tex.

—End



Efficiently Designed Evaporator Cuts Tomato-Processing Cost

PROJECT: *To process tomato juice into paste without impairment of flavor, color or vitamin content. Important requirements: equipment must be adaptable for processing large or small batches of juice; prevent waste from boil-overs and scorching; be economical from standpoint of fuel and maintenance.*

DESIGN: *Evaporator with jacketed lower portion. Jacket is divided into two heights to handle without scorching small or large batches of juice under vacuum at 133° F boiling point. The main evaporator column is of Lukens Stainless-Clad Steel with smooth sodium hydride finish on inner stainless surface to protect product and make cleaning easy; steel backing to provide strength, rigidity and high heat transfer from mild steel steam jacket. Added length of column above jacket to provide extra evaporation area and prevent boil-overs into mild steel condenser column.*

END RESULT: *Tomato paste with rich red color and high vitamin content assured. Less fuel required; product quality improved; maintenance time and cost lowered; no waste from boil-overs. Equipment meets varying raw material supply requirements.*

In this, as in other food processing applications, the coordinated ingenuity of designer, engineer, fabricator and materials supplier resulted in the efficient answer to an equipment problem. This was the result of *Lukenomics*. For Lukenomics combines the experience of equipment designers and builders with Lukens' knowledge of materials and their application, gained over 140 years as the world's leading producer of specialty steel plates, heads and steel plate shapes.

It's sound judgment to put Lukenomics to work on your equipment problems. There are progressive fabricators who can do this for you. Get in touch with them, or write our Manager of Marketing Service, stating your problem. Lukens Steel Company, 401 Lukens Building, Coatesville, Pennsylvania.

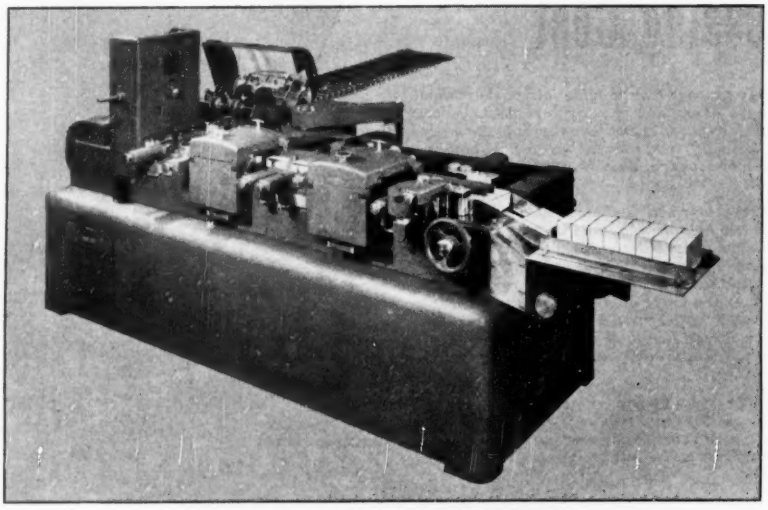
C. E. MacPherson fabricated the vacuum steam cooking kettle illustrated above for Edgewater Canners using Type 347 Lukens Stainless-Clad Steel.

LUKENS

LUKENS STEEL COMPANY

BETTER PRODUCTS FOR BETTER EQUIPMENT

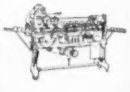
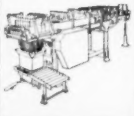
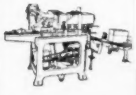
STANDARD-KNAPP EXPANDS ITS FAMOUS LINE TO INCLUDE ROCKWELL CARTONING MACHINES



FULLY AUTOMATIC CARTONING MACHINE
— formerly known as Rockwell Cartoning Machine

STANDARD-KNAPP has acquired the entire line of machinery and equipment formerly produced by Rockwell Packaging Machines, Inc. Designed for versatility, these machines will now be backed up by the engineering, manufacturing, sales and service facilities of the Standard-Knapp organization.

We are prepared right now to discuss the installation of cartoning machines in any plant. Inquiries are invited concerning the application of these and other machines in the Standard-Knapp line to your packaging problems.

UNLOADERS	UNSCRAMBLERS	LABELERS	CAN PACKERS	BOTTLE PACKERS	CARTON PACKERS	GLUERS & SEALERS
						

STANDARD-KNAPP Division of Hartford-Empire Company **PORTLAND, CONN.**

Changes in Food Supplies

Materials

SWEET CORN for processing was running about 31 percent under 1949 production, in early estimates made by BAE. Indicated output was 969,100 tons compared with 1949's actual harvest of 1,404,000 tons for processing.

SNAP BEANS produced for canning and freezing were expected to reach 222,000 tons in the early estimates. This would be about 7 percent under the 238,200 tons produced in 1949.

TOMATOES produced for processing were indicated at 2,608,900 tons, an increase over last year's harvest of 2,530,900 tons.

CHICKS produced in commercial hatcheries during July reached a total of 75,026,000, 27 percent above July, 1949, and 34 percent over the five-year average for the month.

Storage

FROZEN FISH AND SHELLFISH held in storage Aug. 1 totaled 133,133,415 lb., which compares with 127,216,558 lb. held on Aug. 1, 1949.

FREEZER occupancy rose 3 points during July to stand at 72 points on July 31, which was only 4 points below normal. On the same date last year freezer occupancy was only 63 percent.

COOLER space occupied at the end of July was the same as on June 30—60 percent. This was 7 percent above a year ago but 8 points under the average for the date.

Production

FROZEN ASPARAGUS packed in 1950 showed a moderate increase in the NAFFP estimates. A total of 19,353,951 lb. was packed compared with 18,422,240 lb. a year ago. This was the highest output since 1946.

ICE CREAM produced during July reached an estimated 61,325,000 gal., 11 percent under July, 1949, and 14 percent below the 1944-48 average for the month. Production also declined, contra-seasonally, being 2 percent under June. The June-July gain a year ago was 3 percent while the five-year average increase was 10 percent.

AMERICAN CHEESE production in July was estimated at 98,220,000 lb., 14 percent less than the June output, but 2 percent above July, 1949, and 1 percent over the five-year July average. The seasonal drop last year was also 14 percent and the five-year average June-July decline was 11 percent.

CREAMERY BUTTER production reached an estimated 148,225,000 lb. in July, 9 percent more than July, 1949, and 4 percent above the five-year average for the month. Seasonal decline was 11 percent as against 13 percent last year and a five-year average drop of 6 percent.

FROZEN SPRING SPINACH pack amounted to 28,335,195 lb., according to the National Assn. of Frozen Food Packers. This was a drop of 24 percent from last year, but far above any year prior to 1949. About three-fourths of the total was packed in 14-oz. containers.

POULTRY canned or used in canning during July totaled 10,296,000 lb., about the same as July, 1949, but about 23 percent above the five-year average for the month.

Indexes

THE COMMODITY INDEX on foods, compiled by the *New York Journal of Commerce*, rose to 194.6 for the week ending Sept. 15. For the previous week it was 190.6; for August it was 191.2; and for Sept. 1949 it was 183.4.

Business Week's index of business activity stood at 220.7 for the week ending Sept. 9, which compares with 220.1 for the preceding week, 220.8 a month earlier, and 185.4 a year ago.

MARGARINE production for July, as revealed by the Bureau of Census, shows the following comparisons with July, 1949:

	(In Thousands of Pounds)		
	Colored	Uncolored	Total
Production, July 1950	63,498	25,925	89,423
Production, July 1949	10,691	45,426	56,117
Producers' Shipments, July 1950	71,547	28,514	100,061
Withdrawn Tax-Paid, July 1949	10,392	44,975	55,367

ON THE PRODUCTION LINE

Sylvania Hosiery Mills, at Ephrata, Pa., where m'lady's fine nylon hose originate, had this very same production problem on humid days. Nylon thread stretched, became sticky and unworkable. KATHABAR, the true humidity control system for comfort and process atmospheres, eliminated this production bottleneck—assured weather-proof production schedules—saved countless dollars previously lost by quality irregularity. The controlled-humidity atmosphere for nylon, of 80° F and 50% relative humidity, gave employees personal comfort, too.

Write for the complete story and learn how KATHABAR can help you meet your production requirements.

The **Kathabar** system of humidity control for industrial processes and comfort offers you:

★ *FLEXIBLE OPERATION*—Prescribed humidity level maintained regardless of outside conditions—humidifies as well as dehumidifies.

★ *DEPENDABILITY*—Few moving parts—system serviced while in operation—non-corrosive solution.

★ *EASE OF INSTALLATION*—Simple duct arrangement—compact and lightweight—minimum assembly required.

★ *ECONOMY*—Extra low operating cost—needs no licensed engineer.

PREVENTS FROST ON LOW TEMPERATURE COILS

Kathabar

MANUFACTURED BY

Surface Combustion
CORPORATION
TOLEDO 1, OHIO

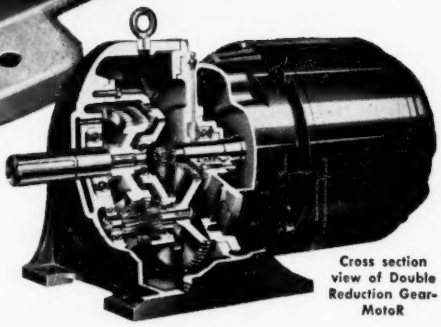
SURFACE COMBUSTION CORPORATION
Kathabar Division
TOLEDO 1, OHIO
Please send Sylvania Mills story to:
Name _____
Address _____
City _____
Zone _____ State _____

ANY SPEED YOU NEED

1 TO 60 H.P.

WITH THE PHILADELPHIA GEARMOTOR

The GearMotoR is a self-contained, *compact* unit conforming to recommended standards of American Gear Manufacturers Association and National Electrical Manufacturers Association . . . Available in single, double and triple reductions . . . Range of speeds: 780 through 7.5 R.P.M. Motor Rating from 1 H.P. through 60 H.P. . . . A-c or D-c. Motors are precision-built and fit perfectly with Gear Unit. Gears are of helical type . . . alloy steel, wear hardened and arranged in simple train for quiet operation and long life . . . Lubrication is splash-type with large reservoir assuring thorough and constant lubrication to all parts of unit . . . Housing is leak-proof, and of sturdy construction.



Cross section view of Double Reduction GearMotoR

Send for 42 page illustrated GearMotoR Catalog. Contains full details. Please write on your Business Letterhead.

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Industrial Gears and Speed Reducers
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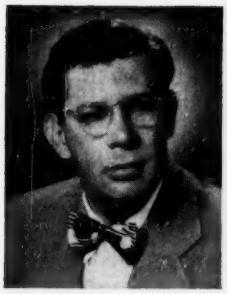
Men, Jobs, Companies



A. WRIGHT DUTCHER has been appointed manager of the Fruitland plant of John H. Dulany & Son, Inc., Fruitland, Md. He was formerly with National Assn. of Frozen Food Packers and American Home Foods and is a member of IFT.

JUNIUS F. ALLEN has been named assistant to H. J. Heinz, president of H. J. Heinz Co., Pittsburgh. Allen started with the company in 1934, and worked successively through the accounting, sales and production operations.

RICHARD S. LIGHT has been appointed vice-president in charge of production for Clinton Foods, Inc. Joining the company early this year from Lever Bros., he will now direct all corn and citrus production facilities throughout the country.

RAYMOND STRITZINGER succeeds the late M. Lee Marshall as chairman of the board of Continental Baking Co. and continues as president. A fourth generation baker, he started as a bakery superintendent in 1908.

Industry

American Bakers Assn. has authorized John T. McCarthy, president, to assume the additional duties of chairman of the board, filling vacancy caused by death of M. Lee Marshall. Tom Smith, secretary, has been appointed executive vice-president.

Borden Co. has acquired Sancken Dairy Enterprises, Augusta, Ga. Latter includes Georgia-Carolina Dairies, Dixie Dairies, Richland Dairies, Greenwood Creamery, and Hancock Creamery.

Canada Dry International, Inc., announces a license agreement with Canada Dry (Australia and New Zealand, Ltd.), who will introduce company's beverages in those countries.

Coca-Cola bottling works, Rockwood, Tenn., is erecting an ultra-modern $150,000 plant.

Fisher-Spiegel Co., Geneva, Ohio, is building a cold storage addition which will hold 400,000 gal. of grape juice.

Foremost Dairies, Inc., has purchased Blue Bird Ice Cream, Inc., Spartanburg, S. C., and will operate it independently under present name.

Fosgate Growers' Co-operative, Forest City, Fla., has organized the Fosgate Citrus Concentrate Co-operative to build and operate a $500,000 concentrate plant.

Great Atlantic & Pacific Tea Co. will construct a $500,000 coffee processing plant in Cleveland to service more than 200 stores in that area.

Holiday Brands, Inc., has leased a two-story plant in Walpole, Mass., for production of crystalline soluble coffee, recently developed by National Research Corp.

Kraft Foods, Ltd., Toronto has started building a 30,000-sq. ft. processing and storage plant near that city.

Morton Foods has begun work on a $500,000 processing plant in Dallas, Tex.

National Biscuit Co. plans to build combination sales offices and warehouses at both Mansfield, Ohio, and Charleston, W. Va.

Pet Dairy Products Co. has purchased Columbia Dairy, Columbia, S. C., and plans to erect a $500,000 processing plant there.

Polk Packing Assn. and Snively Groves, Inc., are completely rebuilding Snively's Winter Haven, Fla., processing plant that was destroyed by fire on June 16. To cost $1,500,000, new plant will have an enlarged concentrate section.

Quaker Oats Co. will build a $1,500,000 plant at Omaha, Neb., to make furfural. Completion is expected at end of 1951.

Seymour Packing Co., Topeka, Kan., has merged into its organization the Perry Packing Co., Kan., George Ehlenberger & Co., Inc., New York, and Mid-Continent Food Products, Chicago.

A. E. Staley Mfg. Co. will start construction on a soybean processing plant at Grand River, Ohio, in January. It will have a daily capacity of 10,000 bu. by the solvent extraction process.

Tobin Packing Co., Rochester, N. Y., has begun a $1,500,000 four-story addition to its Albany, N. Y. plant.

Personnel

George F. Atkinson has been appointed general manager of Durkee Famous Foods Div., Glidden Co., Cleveland.

Dwain Bell, first graduate of Univ. of Minnesota's new course in flour mill engineering, has gone to work for General Mills, Inc.

George N. Collins, formerly general works manager of J. W. Beardsley's Sons, Newark, N. J., is now senior staff member of Wallace Clark & Co., management consultants in New York.

Robert W. Eldred has been named general manager of Armour and Company's plant at Grand Forks, Ill., replacing Gilbert D. Lewis, who will take charge of Peoria, Ill., plant.

Fishery develops at-sea method to clean and sort oysters

● This prominent fishery installed a Cyclone Chain Drive Belt to handle cleaning and sorting operations right on the boat. All debris is dumped back into the sea, leaving more space available for storing oysters and eliminating waste cartage charges.

Cyclone makes three types of conveyor belts —Chain Link, Flat Wire and Flex-Grid—each designed to handle specific problems. Experienced engineers will select the one best suited to *your* production system. Get in touch with our nearest sales office, and write for free Catalog #4.

CYCLONE FENCE DIVISION
(American Steel & Wire Company)
DEPT. H-100, WAUKEGAN, ILLINOIS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

CYCLONE METAL CONVEYOR BELTS
UNITED STATES STEEL

Checkweighing the Fractional Package . . .

EXACT WEIGHT Scales checkweighing hand or machine wrapped sliced bacon. John J. Felin, Philadelphia, Penna.

The fractional package (a breakdown of the standard package into two, three or more units for convenience to the user . . . preserving freshness of the unused product . . . and increasing sales volume for processors) requires a higher degree of weight accuracy than larger units. The reason? Units are smaller and fraction-ounce weights are present. If your present scales do not meet such specifications weights will not be accurate. The test is absolute accuracy with speed of operation added. Only EXACT WEIGHT Scales with fraction-ounce dial markings will assure the results demanded in fractional unit packaging. In fully automatic operation when counting is practiced sound checkweighing protects you against the underweight container. Write for details to fit your needs.

EXACT WEIGHT SCALES
Industrial Precision
THE EXACT WEIGHT SCALE COMPANY
21 W. Fifth Ave., Columbus 8, Ohio
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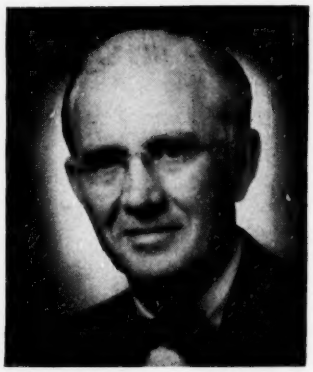


ROY E. MARSHALL, originator of a method of flash pasteurizing apple juice, has been named assistant director of the Michigan State College Agricultural Experiment Station, East Lansing.

Milton Hult, president of the National Dairy Council, has been named to the Food Industry Advisory Committee of the Nutrition Foundation, Inc. Reflected in the appointment is recognition of progress achieved in the Dairy Council's nutrition research program.

Ralph T. Johanson, formerly executive vice-president and general manager of G. Heileman Brewing Co., La Crosse, Wis., has been elected president.

G. E. Mackey has been transferred to Armour and Company's Chicago headquarters to supervise cattle purchasing, dressed beef and bone-in-beef sales, and beef boning operations. Succeeding him as general manager of Kansas City, Mo., plant is Jack Thomas.

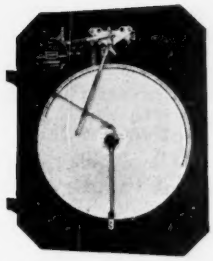
James McGowan, Jr., has been elected chairman of board of Campbell Soup Co. He was also re-elected president.

Leo D. Ovson, formerly executive vice-president of Ovson Egg Co., Chicago, has been elected president to succeed his father, Morris Ovson, now chairman of board.

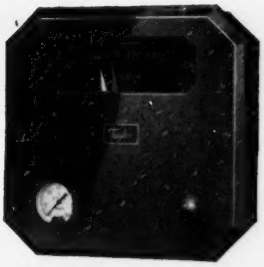
E. L. Schujahn has been named a vice-president of General Mills, Inc. He is in charge of company's general flour operations.

Pawlo Turula, noted European food chemist, has come to this country to join laboratory staff of American Institute of Baking, Chicago.

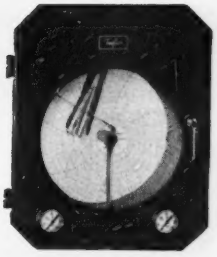
A. P. Strietmann has been elected president of Felbar Biscuit Co. Div.,



1. Taylor Integrating Flowmeters give you accurate basis for figuring costs of steam for departmental processing and heating throughout your plant. Detect any abnormally high steam consumption caused by faulty operation of traps or valves. Equally beneficial for compressed air and water lines.



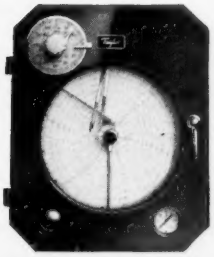
2. 86R Taylor Fulscope* Indicating Controller—a highly dependable air operated temperature controller, which is adaptable to many applications requiring close control but no record: for open vats, pressure cookers, storage vaults, retorts, cooling canals.



3. Taylor Fulscope Recording Temperature Controllers—Quality control in a simple, dependable package. Ideal for automatic temperature control of retorts, sterilizers, storage rooms, open tanks, jam and jelly kettles, cooling canals.

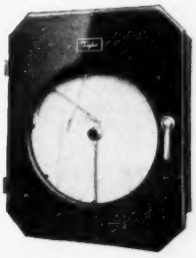
SAVE MONEY

Six ways with Taylor "cost cutters" like these!



4. Taylor Fulscope Recording Controllers with Process Timers for automatic temperature control of retorts. They bring process up to set point then time it. Process Timer enables Fulscope to control process time just as accurately as temperature or pressure.

*Reg. Trade-Mark



5. Taylor Recording Thermometers. For exhausters, lye peelers, retorts, cookers, or any application where you need a written temperature record. They give you an accurate minute-by-minute record that shows any tendency for inequality or improper operation. Highly responsive to smallest temperature changes.

6. Taylor Self-Acting Temperature Controllers are perfect for hot water heaters, open tanks, bottle washers, water condensers and other applications where you don't need precision control. Taylor's complete department store of accurate instruments are designed to keep your quality up and your costs down.

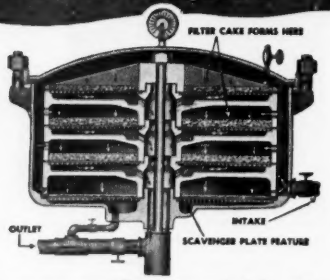
Ask your Taylor Field Engineer! Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada

TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

FOR HIGH SPEED, UNIFORM FILTRATION REQUIRED IN FOOD PROCESSING

SPARKLER *horizontal plate* FILTERS

Capacities 50 G.P.H. to 5000 G.P.H.



HERE ARE A FEW FOOD PRODUCTS THAT SPARKLER FILTERS HANDLE WITH EASE:

- Candy Syrup
- Chicken Broth
- Cider
- Egg Albumen
- Extracts
- Flavors
- Honey
- Gums
- Liquors
- Milk
- Molasses
- Vegetable Oil
- Syrups
- Vinegars
- Wines
- Fruit Juices
- Alcohols
- Alkalies
- Beverages

Sparkler Filters operate on a distinctive principle, using horizontal plates, that are particularly efficient in maintaining uniformity in operation over a wide range of pressure, temperature, or viscosity conditions.

Filters water sparkling clear, removes all off-tastes, odors, color, sediment, chlorine, sulphur, algae, pipe rust, etc.

Because filter media are supported on a horizontal plane and filter aids floated into position uniformly, filtration takes place uniformly over entire filtering areas. Flow through filter is always with gravity. The patented scavenger plate filters the last drop, leaving no hold over in batch filtration.

We invite correspondence on your problems. You will receive the advice of filtration engineers with over a quarter of a century experience in a specific field.

SPARKLER MANUFACTURING COMPANY
MUNDELEIN, ILLINOIS

DETECTO SCALES

There's a precision-accurate Detecto Scale for your specific weighing and counting need. The Detecto helps increase production, yet assures you maximum accuracy by making slightest weight discrepancies immediately visible.

DETECTO-GRAM HEAVY DUTY SCALE

To speed up heavy duty weighing operations, Detecto-Gram Scale Model #1744 insures against overweight losses. Shows weighing error promptly. Famous for hair-line accuracy.

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MAKERS OF FINE SCALES SINCE 1900
540 F PARK AVE. · BROOKLYN, 5, N. Y.
SCALE ENGINEERS IN ALL PRINCIPAL CITIES

United Biscuit Co. of America. Ray L. Woerner has been named vice-president and general manager.

Jack Willis has been made superintendent of newly formed Arkansas Baking Co., Forest City, Ark.

Associated Industry

Clark Equipment Co., Battle Creek, Mich., has named Ivan E. Howard south central supervisor for industrial truck division.

Crown Can Co. has promoted Burk Kraleman to Pittsburgh district sales manager.

Dewey & Almy Chemical Co. has appointed Bradley Dewey, Jr., manager of Cryovac Div.

The Di-Noc Co., Cleveland, has named Edward T. Newton southwestern sales manager.

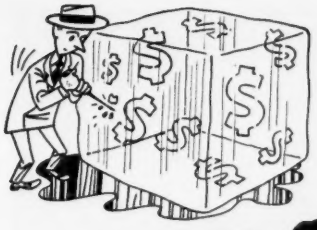
A. B. Farquhar Co., York, Pa., has appointed William L. Allen sales representative in Albany, N. Y., area.

Foster Wheeler Corp., New York, has appointed Pell W. Foster, Jr., vice-president of its newly created Equipment Div.

General Controls, Glendale, Calif., has appointed the following sales engineers: Wm. Stringfellow. Dallas; Hamilton Sudler, New York; Earnest Bruegel, Philadelphia; and R. Roedder, Los Angeles.

Norda Essential Oil & Chemical Co. received the National Industrial Advertisers Assn. Award for 1949, in recognition of the outstanding pre-

KENNETH P. STEINREICH has been elected a vice-president of Jacob Ruppert brewery in New York. He joined the company in June, 1947.



Are hauling costs freezing your profits?

DODGE trucks are "Job-Rated" to save you plenty!

If your food profits have been nipped by old "Jack Cost," you can thaw them out by switching to a truck that fits your job!

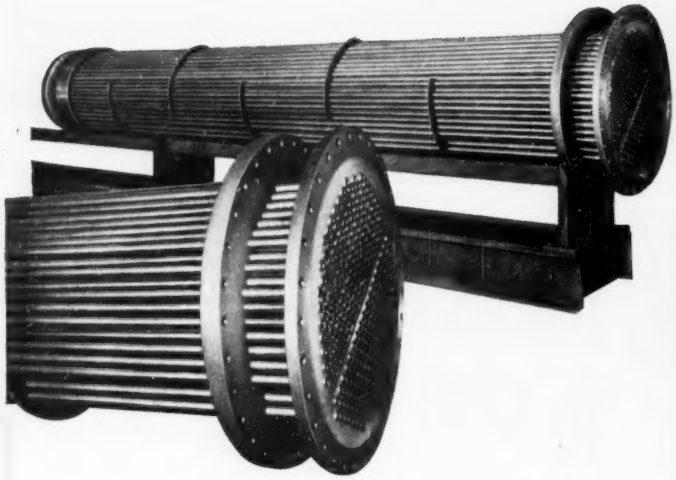
And that, of course, will be a Dodge "*Job-Rated*" Truck!

Every part of your Dodge truck—from engine to rear axle—will be engineered and sized to haul your frozen foods at lowest cost per ton-mile. It will have an engine that's "*Job-Rated*" to give you plenty of power with top-notch economy.

You'll be surprised at the dimes and dollars you'll save with a truck that fits your loads and your roads.

Ask your Dodge dealer to show you how a Dodge "*Job-Rated*" truck can help you put the chill on distribution costs. See him today!

With all their extra value DODGE "Job-Rated" TRUCKS are priced with the lowest



The "Last word" in Heat Exchanger Engineering and Fabrication

This 30" in diameter x 16' tube length bundle has Nickel Outer Tube Sheet, Steel Inner Tube Sheet and Nickel Tubes. Far end of bundle has inner steel tube sheet with Stainless Barrel (smooth machined finish) for packing joint.

View of end shows detailed construction of tube sheet.

We of DOWNINGTOWN solicit your inquiry for heavy duty shell and tube equipment fabricated of Aluminum, Inconel, Nickel, Phosphor Bronze, Copper, Silicon Bronze and various grades of Carbon Steel. Some of these are welded by Heliarc. Downingtown is experienced in building equipment with Bimetalic, Finned Tube and Impregnated Graphite.

Design and construction meet requirements of A.S.M.E. Code or other agency specified by customer. Equipment of our design is sold on a guaranteed performance basis or we will fabricate to customer's drawings. Modern facilities aavilable for checking welding operations by X-RAY. Write on your letterhead for DOWNINGTOWN literature on shell and tube heat exchangers.

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DOWNINGTOWN, PA.
HEAT EXCHANGERS

NEW YORK OFFICE: 30 CHURCH STREET

GEORGE HAMPTON, formerly general manager of Franklin Baker Div., General Foods Corp., has been promoted to operations manager of Franklin Baker, Walter Baker Chocolate & Cocoa, Diamond Crystal-Colonial Salt, and ElectriCooker.

sentation and selling effectiveness of its advertisements.

Packaging Machinery Manufacturers Institute has established an information service at its new office headquarters in New York City.

The Permutit Co., New York City has acquired the ion exchange business and trademark "Ionac" from American Cyanamid Co.

United States Wholesale Grocers' Assn.'s past president, **Charles S. Ragland,** has been appointed a member of the National Distribution Council by Charles Sawyer, Secretary of Commerce.

Warren Steam Pump Co., Inc., Warren, Mass., has purchased Quimby Pump Div. of H. K. Porter Co., Inc., Pittsburgh.

Deaths

Royal Anderson, 56, district supervisor of Piper Baking Co., Chicago—July 31.

Frederick J. Bridge, 74, retired president of Hydrox Corp., Chicago, and vice-president of National Dairy Products Corp., New York—Aug. 5

William E. Brock, 78, head of Brock Candy Co., Chattanooga, Tenn., and former United States senator—Aug. 5.

Henry A. Page, founder and president of Page Dairy Co., Toledo, Ohio—Aug. 29. —*End*

PECTINOLS *Make Fruit Products LOOK as Good as They TASTE*

PECTINOLS bring to your fruit products eye-inviting clarity, while retaining taste-tempting flavor. Regardless of the product or the process, when PECTINOLS go in, cloudy sediment comes out—*fast!* Your beverages, concentrates, syrups or spreads *look* as good as they taste.

You need no special equipment to use PECTINOLS. Just add these special enzymes to pressed juices or mashed fruits, give them a few hours to break down pectic substances, then filter your product clear of sludge and cloudy material. Easy. Inexpensive. Effective.

PECTINOLS are used for:

Clarification of Fruit Juices
Clarification of Frozen Fruit Juice Concentrates
Clarification of Wines
Production of Vinegar
Production of Fountain Syrups
Production of Flavor Extracts
Production of Jellies

PECTINOLS are effective on:

Apples, Grapes, Citrus Fruits
Cherries, Pears, Peaches
Blackberries, Strawberries
Raspberries, Elderberries, Dates
Loganberries, Papaya, Rhubarb

You'll also find PECTINOLS used on fruit and vegetable wastes to recover valuable solids and readily dried presscakes.

OTHER INDUSTRIAL ENZYMES TO IMPROVE YOUR PROCESSING

Enzyme System	Designation	Availability	Action on Substrate
Pectinolytic	PECTINOL	Commercial	Demethoxylates pectic substances and hydrolyzes them to galacturonic acid. pH range 3.5 - 5.
	Pectin esterase	Experimental	Demethoxylates pectin without hydrolysis of the galacturonic acid chain. pH range 3.5 - 5.
Proteolytic	RHOZYME P-11	Commercial	Hydrolyze proteins to peptides and amino acids. pH ranges 5.5 - 8.5. (Relative amounts of peptides and amino acids will differ for each proteolytic enzyme.)
	Protease 15	Experimental	
	Protease 16	Experimental	
Amylolytic	RHOZYME S	Commercial	Hydrolysis of starch to dextrins, maltose and glucose. Contain both an alpha amylase and a strong glucogenic principle. pH range 5-6. RHOZYME S is a purified enzyme; RHOZYME T-22 the crude product.
	RHOZYME T-22	Commercial	
	RHOZYME DX	Commercial	Hydrolysis of starch to dextrins. Heat stable. pH range 5.5-6.5.
Lactase	Lactase A	Experimental	Hydrolysis of lactose to glucose and galactose. pH range 6.1 - 7.5.

For full information regarding PECTINOLS, write to:

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Fresno, California

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1907 - 4th Avenue, South
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FACTS ON FILTERING

Representative case histories on widely varied clarification problems condensed from field reports of Johns-Manville Filtration Engineers

$127.50 Monthly Profit from Orange Oil Formerly Lost

(reported by J-M Engineer H. G. Martin)

LOS ANGELES DISTRICT: A citrus processor in my territory uses high-speed centrifuges for orange oil recovery. After two weeks' operation, there is an accumulation of about 100 gallons of sludge, which has a high content of orange oil. Settling and decanting this sludge yields 75 gallons of oil. By adding Celite to the remaining 25 gallons of heavy sludge formerly discarded and then pressing it, 5 more gallons of orange oil are recovered. Selling for $1.50 per pound, this means a saving of $130.00 in additional orange oil per month. Deducting $2.50 for the cost of Celite used, the operation shows a monthly net profit of $127.50.

Sales Appeal Improved with Celite 545

(reported by J-M Eng. W. A. Reschke)

CHICAGO DISTRICT: A trial run convinced this customer that he had much to gain and nothing to lose by using Celite as a pressing aid in making jelly from frozen grapes.

The equipment used was a vertical hydraulic press. Previously, without Celite, the centrifuges had to be cleaned 3 times a day. With Celite, they required cleaning only once a day. Customer also noted that the cloths were in better condition after pressing with Celite. Production of juice remained about the same, but the jelly was much clearer—it had better sales appeal—and judging from its appearance, a considerably longer storage life could be expected.

These advantages were obtained by the addition of 20 pounds of Celite 545 to each 900-lb. batch of grapes pressed.

Filter Trouble Corrected with Hyflo*

(reported by J-M Engineer R. J. Amberg)

DETROIT DISTRICT: A wine company reported trouble with a new filter which they had installed recently and I was called in to assist.

The problem was to handle the settlings from several thousand gallons of wine without increasing the amount of filter aid which they had been using. The wine is pumped from the main cask to a 260-gallon mixing tank and from there to the filter. There are no facilities for pre-coating with anything but unfiltered wine. We put ten pounds of Hyflo in 200 gallons of wine in the mixing tank and circulated this until clarity was obtained. This was a matter of only a few minutes. The clear filtrate was then turned to a receiving tank. The flow rate was estimated at 6 gallons per square foot of filter area per hour after filtering about 200 gallons.

*T. M. Reg. U. S. Pat. Off.

Engineering Help Solves Filtration Problem

(reported by J-M Engineer G. F. Huber)

BOSTON DISTRICT: One of my customers was having difficulty due to the filter powder coming through the ceramic filter medium. I checked the operation with their technical director and found that incomplete venting of the air from the filter body during precoating permitted air to remain trapped in the upper part of the filter. This prevented the precoat suspension from filling the filter and depositing an even coat upon the stone. As the filtration was continued, the liquid level in the filter rose and gradually displaced the air but meanwhile, of course, some filter aid passed through the stone.

I suggested complete air venting at the start of the precoating and installing a valve on the outlet side. This change in operation resulted in a decided improvement and, needless to say, the customer was greatly pleased.

Your New Problem may be an old one to the CELITE Engineer

These case histories show not only what Celite Filter Aids can do but also how Johns-Manville Filtration Engineers can help you. Small, simple changes in equipment or technique often lead to big results because J-M Engineers combine scientific knowledge with wide practical experience on many filtration problems. In addition, they have access to the resources of the J-M Research Laboratory where modern filtering techniques and filter aids were developed.

For additional information, write Johns-Manville, Box 290, New York 16, New York.

Johns-Manville JM PRODUCTS

***Celite* Filter Aids**

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Books

Campbell's Guide to Canning Industry Revised for Third Edition

CAMPBELL'S BOOK, *3rd Edition. By Clyde H. Campbell, as revised by Rohland A. Isker and Walter A. Maclinn. Published by Vance Publishing Corp.,* 139 *N. Clark St., Chicago* 2, *Ill.,* 1950. 222 *pages;* 9*x*12 *in.; leather composition. Price,* $15.

Long awaited, this revision of an old standby in the canning industry makes a welcome appearance. Those not acquainted with the two previous editions would need to be told that the book offers the basic principles and methods under which foods are processed for canning, pickling and preserving. This, of course, includes full discussion relative to destruction of agents that cause spoilage or inhibition of their action.

Clyde H. Campbell crowned a long service in the food industry with the preparation of this book, published in 1929 and revised in 1937. Both editions were practically exhausted at the time of his death in 1946.

In cooperation with Mrs. Campbell, Colonel Isker and Dr. Maclinn were persuaded to undertake the job of bringing the book up to date for the publication of the third edition. Colonel Isker is best remembered for his wartime service as officer-in-charge of the Quartermaster Subsistence Research Laboratory. Dr. Maclinn is chairman of the food technology department, Rutgers University.

Without claiming to be exhaustive, the book runs the gamut on the preservation of fruits and vegetables, meats, jellies, vinegars and special foods. It also offers detailed procedures on gaining and maintaining quality control.

Its unusual size may make it a difficult book to bury in a book case, which may be what the publishers had in mind when they designed the format.

Canners' Bulletin

TOMATO PRODUCTS, *Bulletin No. 27-L, Revised. By W. D. Bigelow, H. R Smith and C. A. Greenleaf. Published by National Canners Assn. Research Laboratory,* 1133 20*th St., N. W Washington* 6, *D. C.,* 1950. 80 *pages;* 6*x*9 *in.; cloth. No Charge.*

This revised bulletin is of more than passing interest to canners of tomato products. It brings a number of important changes from the 1941 edition, among them being the basing of tables on total solids rather than on salt-free solids.

Probably the most notable new feature is the addition of a chapter on tomato juice, developed largely on the experience and observation of the NCA laboratories.

Copies are being sent to NCA members and to specified laboratories and agencies. Requests for further copies should be directed to NCA's Washington office.

Agricultural Trade

YEARBOOK OF FOOD AND AGRICULTURAL STATISTICS—1948; VOLUME II: TRADE. *Food & Agriculture Organization of the United Nations,* 1950. *Order from International Documents Service, Columbia University Press,* 2960 *Broadway, New York* 27, *N. Y.* 261 *pages;* 8*x*10¾ *in.; paper. Price,* $3.50.

This is the first of the FAO Yearbooks that gives international trade statistics in foods and agricultural commodities. Volume I of the 1948 yearbook, giving production statistics, has been out for about a year; and Volume I of the 1949 yearbook has also appeared recently.

Statistics cover the prewar years and 1945, 1946, and 1947. For some major commodities, figures are also given for the 1947-48 season. Dislocations brought on by the war have made it difficult to balance the statistics shown. Absence of U.S.S.R. statistics has also made it difficult to compile complete data.

Most of the volume is bilingual (English and French). There are also some explanatory notes in Spanish.

Technical Reviews

ANNUAL REVIEW OF BIOCHEMISTRY, *Vol. XIX. Edited by J. M. Luck, H. S. Loring and G. Mackinney. Published by Annual Reviews, Inc, Stanford, Calif.,* 1950. 596 *pages;* 6¼*x*9 *in.; cloth. Price,* $6.

At least 10 of the 22 topics dis-

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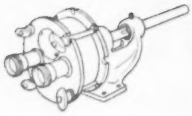

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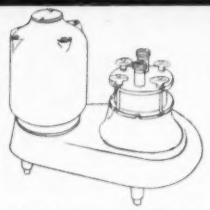

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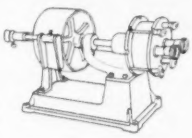

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Conventional drives, flat belt above and V-belt below, as well as gear, direct and up-right models, can be furnished with Sanitor pump.

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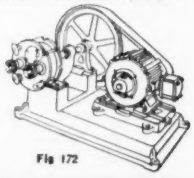

Fig 172

Viking PUMP COMPANY

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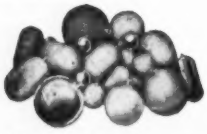
UP STEAM FLOW 50%

for Leading Processor

A striking increase in steam flow from 2000 to 3000 lbs. an hour is reported by a chemical maker who recently replaced a mechanical trap with Nicholsons. This cut cooking time from 105 to 55 min., a gratifying speed-up of 48%. Also widely recommended for their effective venting of non-condensible gases in critical applications.

5 TYPES FOR EVERY PURPOSE—process, heat, power; size ¼" to 2"; press. to 225 lbs. *BULLETIN 450.*



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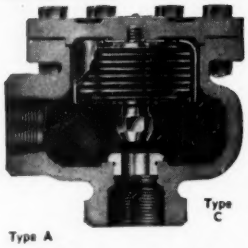

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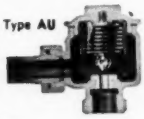

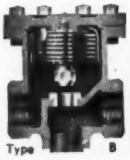

Type B

Type AHV

W. H. NICHOLSON & CO., 193 Oregon St., Wilkes-Barre, Pa.

cussed in this latest volume in the long series will be of interest to the food chemist. And most of the remaining 12 are likely to get more than a passing glance from the food chemist who has them within easy reach.

The ten chapters that bear directly upon food production are: Biological Oxidations, by V. R. Potter; Proteolytic Enzymes, by M. Laskowski; Nonoxidative Nonproteolytic Enzymes, by P. P. Cohen and R. W. McGilvery; Carbohydrate Chemistry, by M. L. Wolfrom and J. M. Sugihara; Chemistry of Lipids, by H. J. Deuel, Jr.; Chemistry of Amino Acids and Proteins, by R. K. Cannan and M. Levy; Water-Soluble Vitamins, by E. E. Snell and L. D. Wright; Fat-Soluble Vitamins, by T. Moore; Nutrition, by H. M. Sinclair; and Biochemistry of Antibiotics, by H. E. Carter and J. H. Ford.

Government Publications

INDUSTRIAL MOBILIZATION PROGRAM. *The Munitions Board, Manual No. 40-1. Price 75c.* A new manual to guide the military departments, other government agencies, and industry in coordinated planning for the production of materials that would be needed in event of war.

PRODUCTION ALLOCATION MANUAL. *Munitions Board, Manual No. 90-1. Price 75c.* Production planning for emergency procurement. Deals with procedures and priority arrangement that would take effect in any major military emergency.

These recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated, the pamphlet is free and should be ordered from the Bureau responsible for its issue.

FARM PRODUCTION, DISPOSITION, AND INCOME FROM MILK, *1948-49. Bureau of Agricultural Economics. Mimeographed.* A statistical summary.

AGRICULTURAL STATISTICS 1949. *U. S. Department of Agriculture. Price $1.75.* Latest of series which brings together each year the more important series of statistics compiled in the Agriculture Department or in other departments whose work concerns agriculture.

FISHERY STATISTICS OF THE UNITED STATES 1946. *By A. W. Anderson and E. A. Power. Fish & Wildlife Service, Statistical Digest No. 19. Price $1.00.* —End

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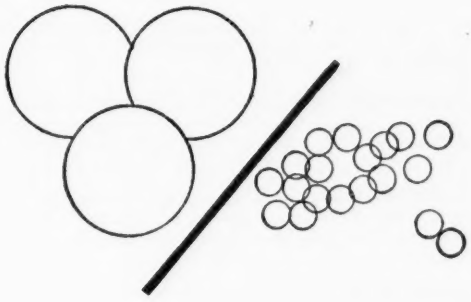

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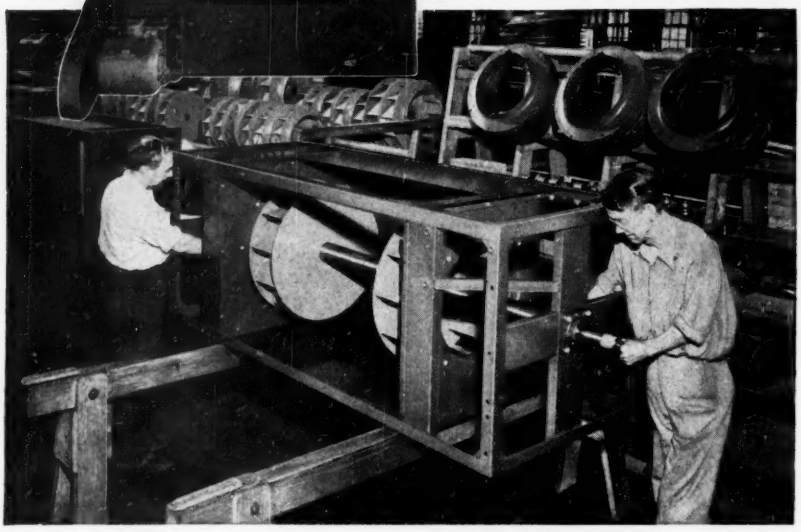
AH Unit

AH fan section being assembled



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Catalogs, Bulletins

Food Plant Equipment

Vertical Turbine Pumps A

Construction details, types of drive and typical installations of vertical deep well turbine pumps are presented in 20-page Bulletin 4700. Capacities vary from 12 to 3,000 gpm.—*The Deming Co., Salem, Ohio.*

Tubular Heat Exchangers B

Process Applications of Heat Exchangers, 20 pages, features diagrammatic operating sketches of 16 different tubular heat exchanger models and many process applications. Construction details are also given.—*The Patterson Foundry & Machine Co., East Liverpool, Ohio.*

Continuous Meter C

The Rotodip meter, described in 4-page Bulletin 65-G1, continuously measures out and feeds at adjustable rates all kinds of low viscosity liquids and suspensions that can be handled satisfactorily in a volumetric feeder.—*Omega Machine Co., Providence 1, R. I.*

Ammonia Compressors D

Newly developed "Y" ammonia compressors, both single- and two-stage, are covered in Bulletin C-1100-B-36. Outstanding features include: Water-jacketed cylinders and heads, babbit-faced box section crossheads, low-pressure piston, self-draining cylinder, and full-floating hollow crosshead pins.—*Worthington Pump & Machinery Corp., Harrison, N. J.*

Dust Controls E

Improved Airmat dust control units are set forth in 8 page Bulletin 280B. Maker reports fixed spacer between pockets provides better sealing; the dust box is panel constructed; and increased head room facilitates pocket removal. —*American Air Filter Co., Inc., Louisville 8, Ky.*

Steam Jet Syphons F

Full line of steam jet syphons, which operate on jet principle utilizing energy of steam under pressure to pump, heat, mix liquids and handle solids, is illustrated in 24-page Bulletin 2-A—*Schutte & Koerting Co., 12 & Thompson St., Philadelphia 22.*

Stainless Steel Valves G

Contained in Catalog 52, 48 pages, are engineering drawings, weights, dimensions, size ranges, materials, corrosion data, nomenclature and design information on stainless steel valve, fittings and accessories.—*The Cooper Alloy Foundry Co., Hillside 5, N. J.*

Centrifugal Pumps H

Stainless steel sanitary centrifugal pumps are treated in 20-page Catalog 250. Also included are comparative viscosity of fluids at varying temperatures, how to figure head of a pump, suction and discharged piping, and effect of speed changes on capacity, head and horsepower.—*Tri-Clover Machine Co., Kenosha, Wis.*

Strainers and Separators I

Y- and T-type strainers, suction strainers, multi-flow separators, and receiver-separators are particularized in 16-page Bulletin 46-50A. —*American District Steam Co., N. Tonawanda, N. Y.*

Vibrators J

Detailed in Catalog 105, 12 pages, is line of vibrators. Featured are 29 mountings and 14 piston diameter sizes that are capable of producing a wide range of vibration densities.—*Cleveland Vibrator Co., 2828 Clinton Ave., Cleveland 13.*

Separating Screens K

How "Gyrocentric" screens are used for both wet and dry separation is detailed in 24-page brochure. Specifications and drawings are included, with over 22 models illustrated.—*The Patterson Foundry & Machine Co., East Liverpool, Ohio.*

Pinch-Type Flexible Valves L

Performance charts, photos and drawings of line of natural and synthetic rubber pinch-type "Flex-Valves" are given in 16-page Bulletin 455. Valves are made of Neoprene, Buna N, Buna S and Butyl.—*Flexible Valve Corp., Palisades Park, N. J.*

Mixers M

Line of "Unique" mixers is pictured in 24-page Catalog 32F. Both horizontal and vertical mixers, with belt and motor drives are shown. —*Mercer-Robinson Co., Inc., 30 Church St., New York 7.*

Screw-Type Rotary Pumps N

Designed for pumping light or viscous liquids, general service rotary screw-type pumps are fully detailed in 8-page Bulletin L313A-B. Capacities range up to 85 gpm., pressures to 150 psi.—*De Laval Steam Turbine Co., Trenton 2, N. J.*

Steam and Air Traps O

Capacity tables and sizing information on steam and air traps is presented in 4-page Bulletin 101. Listed for first time are new "Venturo-Valves."—*The C. E. Squires Co., 18502 Syracuse Ave., Cleveland 10.*

Feeders P

Bulletin 10-D1A, 4 pages, illustrates following types of feeders: Belt-type gravimetric, loss-in-weight gravimetric, groove disk, universal, precision solution, rotodip solution, and rotolock.—*Omega Machine Co., Providence 1, R. I.*

Aftercoolers, Separators, Filters Q

Equipment for removal of water, oil and pipe scale from compressed air systems is described in 8-page Bulletin 176. Shown are aftercoolers, cyclone separators and air filters. —*R. P. Adams Co., Inc., 225 E. Park Dr., Buffalo 17.*

Air Traps R

Used for automatic drainage of moisture from compressed air intercoolers, aftercoolers,

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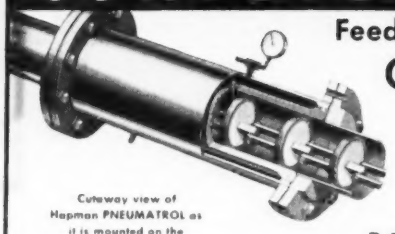
FOR FLOWABLE MATERIALS
U.S. Pats. & Pats. Pend.



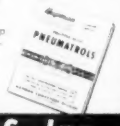
Cutaway view of Hapman PNEUMATROL as it is mounted on the Hapman Tubular Conveyor

Feeding or Processing
CONTINUOUSLY
UNDER
Pressure
or
Vacuum
REDUCES COSTS!

An inner sleeve of rubber or other material, depending on type and temperatures of materials handled, is mounted within the casing of the Hapman PNEUMATROL. By using two or more PNEUMATROLS with a Hapman Tubular Conveyor, the PNEUMATROLS act as seals or corks to retain pressures while permitting the continuous passage of the solid circular flights through them.

HAPMAN PNEUMATROLS, used integrally with the Hapman Tubular Conveyor, now make possible the continuous feeding and/or processing of flowable materials into and out of pressure or vacuum zones. This development enables food and chemical products to be processed while being conveyed from one point to another, or you can handle products into and out of processing zones, eliminating time-consuming batch methods.

THIS FOLDER BELONGS IN YOUR FILES
Complete details on Hapman PNEUMATROLS—typical layouts—dimension and capacity charts—are given. Your request will bring it to you promptly.



SALES OFFICES IN PRINCIPAL CITIES

HAPMAN CONVEYORS, Inc. 630-a GIBSON ST.
Division HAPMAN-DUTTON COMPANY • KALAMAZOO 6, MICH.

receivers, separators and drip points, air traps are particularized in 4-page Bulletin 202.—*Armstrong Machine Works, Three Rivers, Mich.*

Filter Presses A

Data on filter presses and special chart are contained in 4-page leaflet aimed to make picking the right size press easy.—*D. R. Sperry & Co., Batavia, Ill.*

Diatomaceous Filters B

Six-page brochure illustrates how "Diatomite" filters work. Slurry feeder, filter leaf, cleaning of leaves and sluicing devices are explained.—*Enzinger Union Corp., Angola, N. Y.*

Automatic Speed Controls C

New line of automatic speed controls for rotary motion is described in 8-page Book 2349. Electronic, hydraulic, pneumatic and mechanical systems are covered.—*Link-Belt Co., 307 N. Michigan Ave., Chicago 1.*

Electric Trap D

Four-page folder sets forth operation and typical installations of an electrically operated trap for pumping and lifting service, or for draining vacuum lines.—*The Johnson Corp., Three Rivers, Mich.*

Materials Handling

Wheel, Belt and Roller Conveyors E

Portable wheel, roller, and standardized and portable belt conveyors are pictured in 12-page Bulletin MD 50. Construction and installations are shown.—*Mathews Conveyor Co., Ellwood City, Pa.*

Truck Casters and Wheels F

Line of truck casters and wheels is detailed in 50-page Catalog K-38. Included for aid in quickly and accurately choosing right caster for any type of service is 12-page Caster Selector bulletin.—*Bond Foundry & Machine Co., Manheim, Pa.*

Conveyor Equipment G

File-size 48-page booklet pictures complete line of company's products. Large portion deals with conveyors, and conveyor accessories.—*The Jeffrey Mfg. Co., Columbus, Ohio.*

Carloader H

Recommended for handling bulk grain, chemicals and other pulverized granular free-flowing materials is a new model carloader described in 4-page Bulletin 27. It can accommodate two trucks at a time.—*Sprout, Waldron & Co., Inc., Muncy, Pa.*

Circular Bin Discharger I

New Bulletin 250, 4 pages, describes circular bin dischargers designed for handling pulverized, granular, glutenous and soft lump materials that may puck or arch, refuse to discharge by gravity, or may aerate and surge through too rapidly.—*Stephens-Adamson Mfg. Co., Aurora, Ill.*

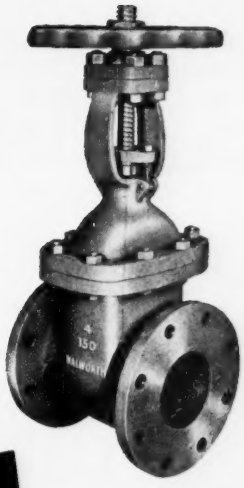
Hand Lift Trucks J

Two 4-page bulletins particularize hand lift truck models. One covers "Red Arrow" single-stroke mechanical lift trucks with capacities from 2,500 to 5,000 lb. Other gives details on "Hydromatic" fluid ram lifts, with capacities to 8,000 lb.—*Lift Trucks, Inc., 2423-35 Spring Grove Ave., Cincinnati 14.*

Feeder-Weigher K

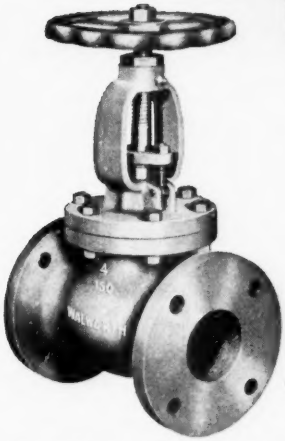
A self-testing feeder-weigher, the "Conveyometer," is illustrated in 6-page Bulletin

Newly Designed Walworth Valves to combat corrosion

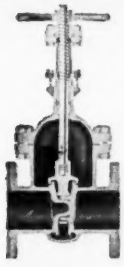


Walworth 150-pound Stainless Steel Gate Valve . . . available in sizes ½ to 3-inch, screwed; ½ to 12-inch, flanged.

Made of Stainless Steel
Monel · Nickel
Acid-resisting Bronze
Ni-resist



Walworth 150-pound Stainless Steel Globe Valve . . . available in sizes ½ to 3-inch, screwed; ½ to 6-inch, flanged.



Sectional view of Walworth 300-pound Stainless Steel Gate Valve . . . available in sizes 2 to 6-inch, flanged.

— ENGINEERED AND TESTED FOR TOUGH . . . HARD SERVICE

Walworth offers a comprehensive line of valves made of several cast stainless steels and special alloys for piping services where corrosion is a factor. These valves are available in Gate, Globe, Angle, Check, and Lubricated Plug types.

Gate, Globe and Angle Valves have outside screw and yoke construction, thus keeping the stem threads out of contact with the corrosive material in the line. They also have a two-piece bolted gland with ball-type gland follower to prevent binding the stem when packing bolts are tightened. Gland eye-bolts can be conveniently swung out of the way without danger of loss when the gland is lifted for repacking.

Gate Valves have taper seats with a unit consisting of two flat faced discs supported by a carrier on the end of the stem. The discs are of a proven ball-and-socket type. They are free to rotate and adjust themselves to the body seat angles, assuring tight seating with no possibility of sticking in any position.

For further information about Walworth's full line of corrosion-resistant valves, see your Walworth distributor.

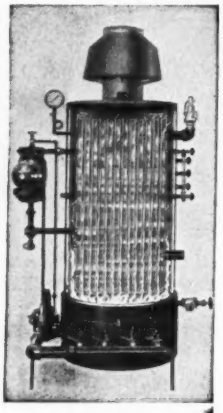
WALWORTH

valves and fittings

60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

MAXIMUM AUTOMATIC STEAM IN MINIMUM FLOOR SPACE...



The KANE Boiler is built to A.S.M.E. specifications, in sizes to 30 H.P. .. ..

THE KANE BOILER PACKAGE

Each KANE BOILER PACKAGE is carefully considered by us as an "individual" job,—from the customer's requirements to the finished unit. And each BOILER PACKAGE is a compact, self-contained steam source that includes: the correctly sized KANE Automatic Gas-Fired Boiler complete with gas burner and controls to maintain required steam pressure; and an M-K-O Automatic Boiler Feed system designed to return condensate and supply make-up water as required for highest operating efficiency.

The M-K-O Automatic Boiler Feed returns condensate and supplies small quantities of hot water as needed to the KANE Boiler.

Engineered Steam at its best with four decades of experience at your disposal —so, send your steam problem to us for study and recommendation.

WE HAVE MOVED and will now serve you from our modern newly completed Factory and Office Building. Our new mailing address is as given below.

ENGINEERED STEAM AT ITS BEST

MEARS-KANE-OFELDT INC.

CHURCH ROAD, UPPER MERION, PENNA.

FOUR DECADES OF AUTOMATIC GAS-FIRED BOILER MANUFACTURING EXPERIENCE.

3849. It embodies a true scale that weighs a prescribed mass of material irrespective of such variables as belt speed or tension, angle of repose or skirt board friction.—*Richardson Scale Co., Clifton, N. J.*

Pneumatic Conveyors, Bag Filters **A**

Four-page Bulletin 1003 pictures operation of multi-bag filters and pneumatic conveyors.—*Dracco Corp., Cleveland 5.*

Troughing and Return Idlers **B**

Two new folders describe troughing and return idlers that feature "snug" design and permanently lubricated ball-bearings or roller bearings.—*The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58.*

Control Equipment

Recording Gages **C**

Complete information on line of recording gages is given in 32-page Bulletin G621. Types covered are pressure, vacuum, low range draft and pressure, and absolute pressure gages, and barometers.—*The Bristol Co., Waterbury 20, Conn.*

Manometric Gage, Incubators **D**

New 20-unit "Manometricon" for micro gas reactions and an incubator for metabolic studies are detailed in 10-page Bulletin 675.—*Precision Scientific Co., 3737 W. Cortland St., Chicago 47.*

Photoelectric Colorimeter **E**

Bulletin 409, 4 pages, describes new photoelectric colorimeter. It is said to be fast, but accurate, and easy to operate.—*Photovolt Corp., 95 Madison Ave., New York 16.*

Direct Current Recorder **F**

Construction features and specifications of portable direct current recorder are outlined in 4-page Publication TP-18-A. Minimum full scale range is 100 microamperes; maximum 5,000 milliamperes.—*Wallace & Tiernan, Belleville, N. J.*

Plant Supplies

Corrosion Resistant Materials **G**

Applications and specifications of 8 corrosion-resistant materials are presented in 16-page Bulletin L. Materials discussed are Tygon, Tygoflex, rubber, Resilon, ceramics, Duralon, acid-brick and cements, and lead.—*U. S. Stoneware, 60 E. 42 St., New York 17.*

Anti-Corrosion Alloys **H**

Process equipment that resists corrosion is listed in 8-page Catalog K. Alloys used are Duriron, Durichlor, Durimet 20, Chlorimet 2, Chlorimet 3 and Durco D-10.—*The Duriron Co., Inc., Dayton 1, Ohio.*

Antiseptic Hand Soap **I**

The new chlorinated diphenyl methane compound, hexachlorophene, that acts against bacterial flora on the skin, is now contained in a liquid antiseptic hand soap. It's described in 8-page booklet.—*West Disinfecting Co., 42-16 West St., Long Island City 1, N. Y.*

Labels **J**

All types of labels for nearly every conceivable plant use are pictured and specified in 32-page booklet.—*Ever Ready Label Corp., 357 Cortland St., Belleville 9, N. J.*

Motive Power Batteries **K**

A new casting technic aimed to eliminate grid porosity and also a long-lasting positive plate are features of six new rubber jar batteries for industrial trucks. Each is detailed in a

two good ways to—

BEAT THE HIGH COST OF FLAVORING

PEP-O-ROL®
MM&R
Closely approximates the flavor of
BLACK PEPPER

CARD-O-MAR
MM&R
Closely approximates the flavor of
CARDAMOM OIL

Low-cost blends of pure Spice Essential Oils...perfected in the laboratories of MM&R!

As THE MARKET in Black Pepper and Cardamom grows increasingly critical, more and more food processors are turning to MM&R's *natural* replacements — PEP-O-ROL and CARD-O-MAR MM&R. Here are two scientifically perfected oils that can be used *successfully* in place of the spices they duplicate. Yet they cost many times *less!*

Whether you use Black Pepper and Cardamom in crude spice, dry spice or Essential Oil form, you'll be amazed at the ease with which these spices can be replaced in whole or in part by PEP-O-ROL and CARD-O-MAR MM&R.

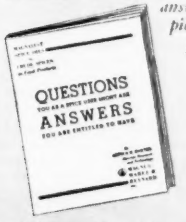
Write MM&R Technical Service Dept. today for full information.

*contains natural oleoresins as well as pure spice essential oils.

13 reasons why MM&R MAGNATEST SPICE OILS GIVE BETTER RESULTS

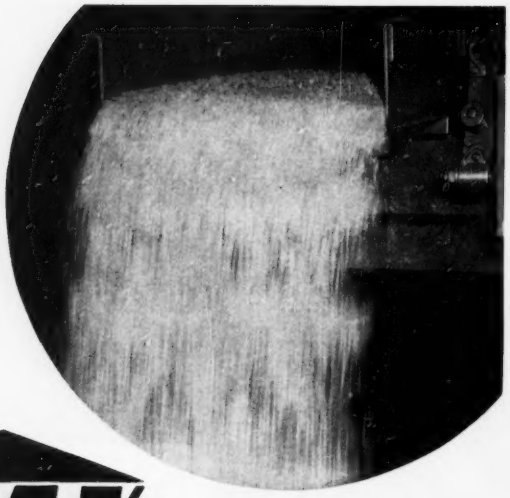
1. more economical.
2. make it possible to flavor your product uniformly.
3. cannot cause discoloration.
4. do NOT mold.
5. release 100% of flavor immediately.
6. prevent introduction of rodent excreta, hair or pellets, insects or insect fragments, etc.
7. always constant in flavor value
8. easy to measure in exact quantities.
9. take up less storage space than crude spices or flavored salt or sugar.
10. decrease freight expense.
11. prevent losses due to exposure during storage.
12. easy to blend.
13. prevent overflavoring of prepared food products during shelf life.

FREE! *An important technical paper — in the form of questions and answers — that will give you a clear and complete picture of the place of Spice Essential Oils in the flavoring of food products. Write for it now!*



MAGNUS, MABEE & REYNARD, INC.
SINCE 1895 ONE OF THE WORLD'S GREATEST SUPPLIERS OF ESSENTIAL OILS
16 DESBROSSES STREET, NEW YORK CITY • 221 NORTH LASALLE STREET, CHICAGO

LOS ANGELES: BRAUN CORP. • SEATTLE, PORTLAND, SPOKANE: VAN WATERS AND ROGERS, INC. • SAN FRANCISCO: BRAUN-KNECHT-HEIMANN CO.



AJAX LO-VEYORS

CONVEY MATERIALS
fast, easy and at low cost

Write for Bulletin

Anyway you look at it, materials handling is a non-productive operation. There is no money in moving bulk materials by antiquated methods. That's why the Who's-Who of American industry are cutting costs and speeding up production with Ajax Lo-Veyors.

They are self-contained vibrating conveyors ready to set in place and use. Easy installation on your floor, below your floor or suspended from wall or ceiling.

Widely used for long runs, short runs, hot and cold materials.

Meets the most rigid sanitary requirements. Tubular and covered pan models successfully used under explosive conditions. Low first cost...low operating cost...low maintenance cost.

Available in open or closed pan and tubular types in various lengths, widths and capacities.

AJAX FLEXIBLE COUPLING CO. INC.
Westfield, New York

data sheet.—*Gould Storage Battery Corp., Trenton 7, N. J.*

Photographic Materials **A**

Modern Drawing & Document Reproduction, 16 pages, illustrates improved methods of reproducing tracings, blueprints and opaque drawings on paper, film and cloth.—*Eastman Kodak Co., Rochester 4, N. Y.*

Fast-Selling Thermo-Adhesive **B**

Known as "Imac BT," new fast-setting, hot-strength thermo-adhesive is fully detailed in 6-page bulletin. It is available on White Litho and Kromekote cover stock.—*Nashua Gummed & Coated Paper Co., Nashua, N. H.*

Adhesives **C**

Materials for which adhesives are specifically recommended and the method by which the most effective bond is created are covered in 8-page Catalog Section 9160.—*The B. F. Goodrich Co., Akron, Ohio.*

Miscellaneous

Frozen Dessert Information **D**

A *Handbook on Frozen Desserts* gives the ice cream manufacturer a summary of useful information aimed at all-around quality improvement.—*American Maize-Products Co., 100 E. 42 St., New York City.*

Solvent Extraction **E**

Comparison between new liquid-liquid solvent extraction and fractional distillation is presented in 8-page Bulletin 12. Multi-stage liquid-liquid extractors are illustrated.—*Otto H. York Co., Inc., 69 Glenwood Pl., East Orange, N. J.*

Research Facilities Shown **F**

Commercial research and testing facilities used in grain and flour milling, and other food fields are described in 32-page bulletin. These testing accommodations are reported available to industry on a non-profit basis.—*Allis-Calmers Mfg. Co., S. 70 St., Milwaukee.*

Sanitation in Meat Plants **G**

New 34-page publication, *How to Cut Sanitation Costs in Meat Packing Plants*, is now available. It covers all plant cleaning operations.—*Oakite Products, Inc., 22 Thames St., New York 6.*

Sludge Control Valve **H**

Complete design data on telescoping sludge control valve is given in 4-page Technical Supplement TV. The valve is designed to provide positive and visual control of sludge withdrawal from hoppers of settling tanks.—*American Well Works, Aurora, Ill.*

Flavor in Foods **I**

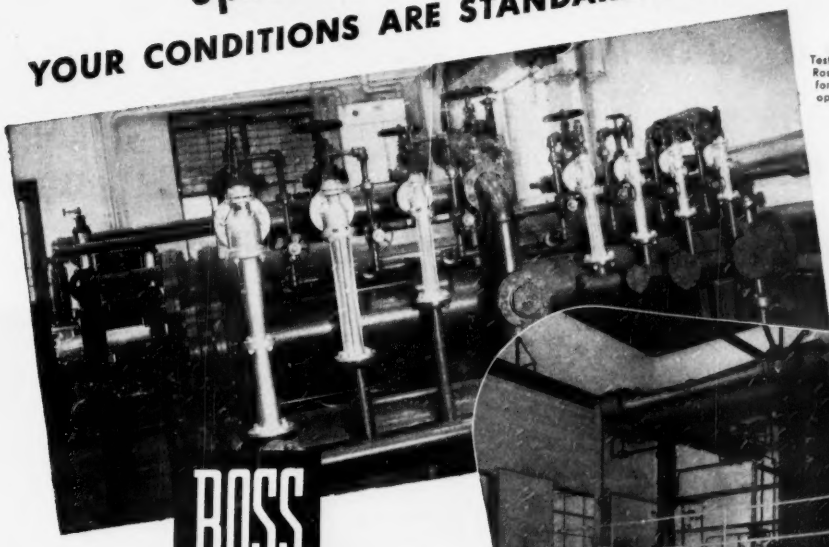
Formulas and methods for improving flavor in foods, by use of monosodium glutamate and hydrolyzed vegetable proteins, are offered in 12-page pamphlet.—*The Huron Milling Co., 9 Park Pl., New York City 7.*

Story of Aluminum **J**

Special 96-page wire-bound book, *The A-B-C's of Aluminum*, is a complete past-and-present history of this broadly used metal. Text is divided into three sections, as indicated by title: A for Alloys, B for Benefits, and C for Consumption. Notable feature is series of 69 pictures and charts graphically tracing product from raw ore to final fabrications. (Because of limited supply, company asks that those interested in book support their requests with direct communications on their own company letterheads).—*Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.* —*End*

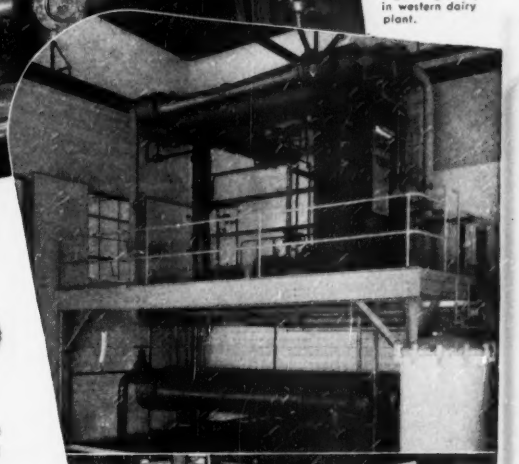
Special or normal . . .

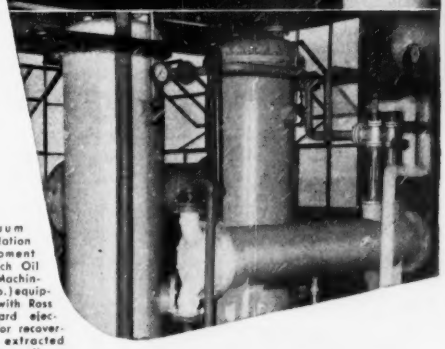
YOUR CONDITIONS ARE STANDARD HERE



Test Rack, equipped with Ross standard ejectors, for a wide range of operating conditions.

Two Ross Decalorators (vacuum refrigerating units) in western dairy plant.





Vacuum distillation equipment (French Oil Mill Machinery Co.) equipped with Ross standard ejectors, for recovering extracted soy bean oil.

ROSS

STEAM JET EJECTORS

Your conditions may be classed "special", or you may consider them "normal". But to Ross, most conditions are *standard*, are quickly met by long, diversified engineering experience . . . highly developed plant skills.

For during the many years that Ross has been designing and fabricating steam jet ejectors . . . starting with their use on surface condensers and following with the more general, industrial applications on vacuum refrigeration, vacuum distillation and oil deodorizing equipment, Ross engineers have gained the position *and the reputation* of dealing with *any* problem quickly, practicably, economically.

As a result of such experience, Ross has been able to standardize ejectors . . . to establish a series of standard frame sizes. Therefore, by simply selecting the most suitable size steam nozzle and other parts, normal requirements can be quickly accommodated. And by the same token, so-called "special" conditions are quickly met, too . . . some through modification of standard units . . . others through individualized engineering and fabrication.

GAIN TIME — Wide experience enables Ross engineers to be of genuine assistance to you . . . whether your conditions call for single or multi-stage units, with or without surface or barometric inter and after condensers. Feel free to consult.

ROSS HEATER & MFG. CO., INC. Division of American Radiator & Standard Sanitary Corporation **1443 West Ave., Buffalo 13, N. Y.**

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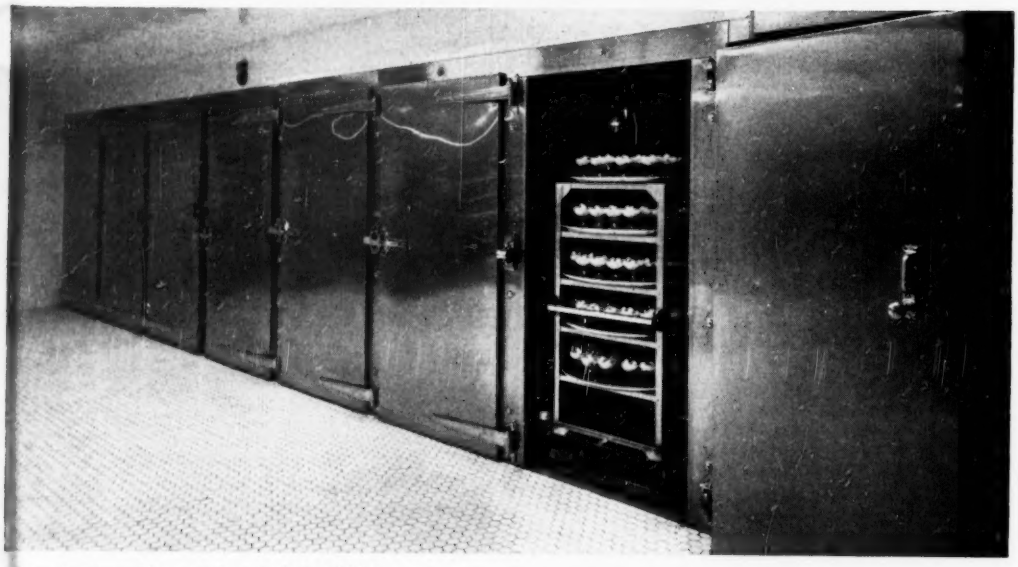
Serving home and industry

AMERICAN STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILERS • ROSS HEATER • TONAWANDA IRON

The SHOREHAM serves

2,000 fruit cups at one time . . .

. . . through sanitary, efficient *JAMISON* doors



Seven Jamison cold storage doors in the salad kitchen at The Shoreham Hotel completely metal clad with polished stainless steel and equipped with chrome plated hardware.

At Washington's Shoreham Hotel the fruit cup and salad always have that crisp, freshly prepared taste whether the party consists of two or two thousand. You'll find the secret in advance preparation and storage at exactly the right temperature to maintain crispness and flavor.

Easy access to the shallow salad cooler is provided by a group of Jamison stainless steel cold storage doors. They match in attractive appearance and ease of cleaning the all-tile kitchen where they are installed.

You will find a Jamison door for every cold storage requirement. The line of standard doors will meet most needs and special designs will be built to your specifications. For full information on the line of Jamison doors, request Catalog 175.

JAMISON
HAGERSTOWN, MARYLAND, U. S. A.

The leader for more than 50 years

JAMISON COLD STORAGE DOOR CO. • HAGERSTOWN, MD., U. S. A.

Patents

Oil Recovered From Fish Livers By Maceration and Centrifuging—*K. J. Sarland to Aktiebolaget Separator, Stockholm, Sweden. No. 2,507,614. May 16, 1950.*

Fish and Meat Heat-Treated in Retort Fitted With Shelf Units Interconnected to Convey Steam to Highest and Lowest Shelves With Outlet for Connection to Vacuum Pump—*V. M. David, Vancouver, B. C., Canada. No. 2,507,891. May 16, 1950.*

Sugars Electrolytically Reduced to Polyhydric Alcohol—*H. R. Hefti and W. Kolb, Zurich, Switzerland. No. 2,507,973. May 16, 1950.*

Wax Extracted From Sugar Cane Filter-Press Cake By Action of Countercurrent Flow of Heated Water-Immiscible Organic Solvent—*O. J. Swenson, Ithaca, N. Y., to The Cuban-American Sugar Co., New York City, and S. C. Johnson & Sons, Inc., Racine, Wis. No. 2,508,002. May 16, 1950.*

Citrus Products Dried to 0.05 Percent Moisture Content By Freezing and Hermetically Packaged Under Conditions to Keep Final Moisture Content Not More Than 0.15 Percent—*E. W. Flosdorf, Forest Grove, and F. J. Stokes, Jr., Philadelphia, to Tabor-Olney Corp., Baltimore, Md. No. 2,508,107. May 16, 1950.*

Animal Feed Material Made to Contain 50 to 70 percent Lactose on Dry Basis—*R. R. Haugh, Evanston, to Kraft Foods Co., Chicago. No. 2,508,112. May 16, 1950.*

Air Content of Ice Cream Controlled By Sonic Method—*R. Friedman, Madison, Wis., to Westinghouse Electric Corp., East Pittsburgh, Pa. No. 2,508,152. May 16, 1950.*

Liquid Foods and Like Heat-Treated During Passage Through Hollow Cylinder Divided Into Separate Chambers and Fitted With Means for Supplying Steam Under Pressure and With Tapered Valves—*C. O. Ball, Maumee, O., to Owens-Illinois Glass Co. No. 2,508,212. May 16, 1950.*

Partially Degerminated Corn Flour With Starch Content of 70 to 79 Percent Sprayed With 18 Deg. Bé HCl. and Roasted at 310 to 350 Deg. F. to Make Dextrine Product Containing About 80 Percent Water Soluble Solids for Use as Core Binder—*F. B. Baker, Chicago, deceased, to R. C. Baker, Executrix. No. 2,508,359. May 23, 1950.*

Tocopherol-Containing Vegetable Oil Extracted By Countercurrent Flow of Liquefied Paraffinic Hydrocarbon Solvent For Concentration of Vitamin E—*A. W. Hixson, Leonia, N. J., and R. Miller, New York City, to The Chemical Foundation, Inc. No. 2,508,387. May 23, 1950.*

Shortening For Batters, Doughs, and Like Made to Contain From 12 to 30 Percent By Weight of Glycerol Monoester or Propylene Glycol Monoester—*E. B. Jaeger, Philadelphia. No. 2,508,393. May 23, 1950.*

Quantity of Mix Delivered Into Freezing Chamber Automatically Proportioned to Desired Quantity of Frozen Product to Be Delivered—*A. J. Tacchella to Steady Flow Freezer Co., Portland, Ore. No. 2,508,435. May 23, 1950.*

Granular Foodstuffs Coated With Three Layers of Enrichment Containing Riboflavin, Thiamin, Niacin, and Iron Salt With Aid of Abietic Acid and Acetone—*L. Stievater, Jr., Scotch Plains, N. J., and P. Stecher, New York City, to Merck & Co., Inc., Rahway, N. J. No. 2,508,477. May 23, 1950.*

Porous Agglomerates Made of Tapioca and Waxy Starches—*A. G. Olsen, Summit, N. J., to General Foods Corp., New York City. No. 2,508,533. May 23, 1950.*

Caffein Extracted From Water Extraction of Coffee By Use of Water-Immiscible Organic Caffein Solvent—*A. C. Shuman, Rutherford, N. J., to General Foods Corp., New York City. No. 2,508,545. May 23, 1950.*

Refined Phosphatides Recovered From Oil Foots—*P. A. Singer and H. J. Deobald, Peoria, Ill., to Allied Mills, Inc., Chicago. No. 2,508,624. May 23, 1950.*

Cream Cheese Made to Contain About 75 Percent Milk Fat—*R. P. Chenier, Villemomble, France. No. 2,508,663. May 23, 1950.*

Freshly Baked Thin Flat Waffle Type Sugar Cake Shaped Into Flat Bottom Edible Dish With Uniformly and Regularly Curved Sides Before Becoming Dry and Hard—*F. W. Moffett, Jr., Gates, N. Y. No. 2,508,724. May 23, 1950.*

Green Caps Removed From Fresh Strawberries By Immersing in Liquid Refrigerant to Freeze Caps and by Agitating Berries in Refrigerant—

If You Are Having Difficulty Maintaining Your Mailing Lists...

Probably no other organization is as well equipped as McGraw-Hill to solve the complicated problem of list maintenance during this period of unparalleled change in industrial personnel.

McGraw-Hill Mailing Lists cover most major industries. They are compiled from exclusive sources, and are based on hundreds of thousands of mail questionnaires and the reports of a nation-wide field staff. All names are guaranteed accurate within 2%.

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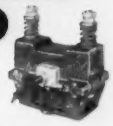
Thru Bins, Hoppers
And Chutes



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"Pulsating Magnet"

ELECTRIC VIBRATORS

and watch the material flow!

Banged-up and dented bins and hoppers cost money in replacement and in man hours lost—and that's where SYNTRON Vibrators come in. They eliminate the arching and plugging that takes a man's time to pound, and damage, those bins and hoppers. Models available for small hoppers up to large storage bunkers.

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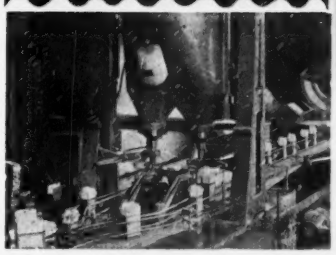
REPORT



NO MORE COSTLY DELAYS—Syntron Model V-15, mounted on a packaging machine hopper, similar to that shown above, eliminated stoppages due to prepared mix "arching" and plugging in hopper. Prior to installation of Vibrator, it was necessary to shut down the entire conveyor system until an operator pounded the prepared mix free again. This Syntron Vibrator paid for itself during the first few weeks.

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460 Lexington Ave. Homer City, Pa.

For Lowest Cost Per Load-
Use Dependable
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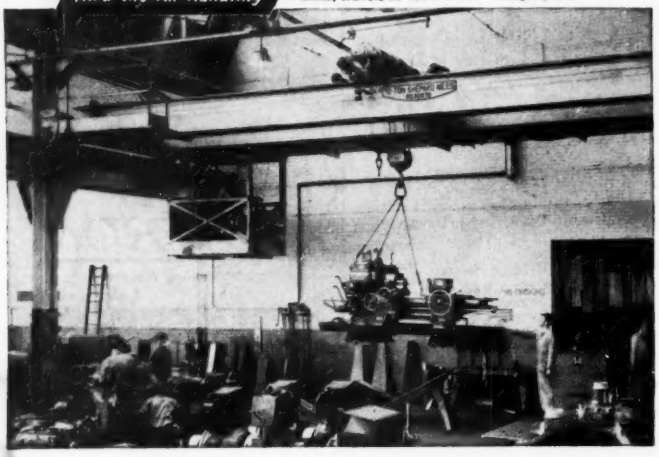
For this installation, operating conditions called for rapid travel over a large area. Controlled by operator in the cab, this Shepard Niles 10-ton, welded-beam crane, with main and auxiliary hoist units, travels at 450 F.P.M.—bridge speed.



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WHAT are *your* problems? Under **WHAT** conditions will *your* crane be operated—intermittently, or under fairly constant conditions? **WHAT** are the operating speeds necessary to meet *your* productive cycle?

Your answer to these and similar questions will enable us to engineer your installation so that it will give you the best, and longest service—at the lowest cost per load over the years.

Be sure you get the crane best qualified to do *your* job. It's wise—and costs you nothing—to get the facts first, rather than to make expensive changes later.

May we place our experience of a great many years of successfully designing all types of crane installations at your disposal?

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Makes and sells all three lifting tools for airborne shop loads

422 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

J. H. Stansbury, Wrightsville Beach, N. C., to Stansbury, Inc., Baltimore. No. 2,508,728. May 23, 1950.

Soya Oil Refined by Degumming, Subjecting to Vacuum Distillation in Atmosphere of Oxygen-Free Inert Gas for Removal of Tocopherols and Free Fatty Acids, and Deodorizing—*J. L. Jakobsen, Minneapolis to General Mills, Inc. No. 2,508,919. May 23, 1950.*

Evisceration of Poultry Aided by Use of Tool Consisting of Handle, Relatively Long, Slender Shank, Loop Attached to Shank and Serrated Along One Edge—*E. M. Lynn, Chicago. No. 2,508,957. May 23, 1950.*

Flavoring Emulsoid Made to Consist of Not Less Than 15 Percent Hexitol Polyoxyethylene Mono-Fatty Acid Esters, Not Less Than 5 Percent Oleoresinous Material, and Not to Exceed 60 Percent Sugar.—*T. B. Tribble, Evanston, to Flavor Corp. of America, Chicago. No. 2,508,978. May 23, 1950.*

Raw Sugar Cane Juice Subjected to Double Purificaton Treatment to Remove Heat Labile, Lime Precipitates and Recover Sugar From Massecuite—*H. Schreiber, Lansing, Mich. No. 2,509,111. May 23, 1950.*

Fresh and Uncooked Food Preserved By Submersion in Syrup Composition Including Bleach and Chilling While Under Pressure—*E. Grom, Los Angeles. No. 2,509,299. May 30, 1950.*

Continuous Mixer Constructed to Grind, Mix, and Knead Simultaneously Under Controlled Temperature Conditions, Independent of Working Pressure—*G. A. Vasel, Elkins Park, Pa. No. 2,509,379. May 30, 1950.*

Milk Cans Mechanically Dumped and Held in Draining Position Until Fully Emptied—*H. M. Kendall, Potsdam, N. Y. No. 2,509,393. May 30, 1950.*

Raw Diffusion Beet Juice Rapidly Concentrated to 65 to 75 deg. Brix and Stored at 25 deg. C. to Preserve Sugar Content—*P. W. Alston, Berkeley, C. J. Moroney, San Mateo, and W. K. Gray, San Francisco, to Spreckels Sugar Co., San Francisco. No. 2,509,408. May 30, 1950.*

Glycerides of Plurality of Fatty Acid Heat-Treated to 250 deg. C. for at Least One Hour in Presence of Boric Acid and Distilled for Recovery of Mono- and Diglycerides—*G. Barsky to E. F. Drew & Co., Inc., New York City. No. 2,509,413. May 30, 1950.*

Shortening Agent Made to Consist of Glyceride Oil With Shortening Properties and of Reaction Products of Mono- and Diglycerides of Higher Fatty Acids With Water-Soluble Acid—*G. Barsky to E. F. Drew & Co., Inc., New York City. No. 2,509,414. May 30, 1950.*

Wheat Flour Made to Contain Germ, Aleurone, and Endosperm Portions and Outer Bran Layer Milled to Flour Fineness—*D. H. Brown, Chicago. No. 2,509,418. May 30, 1950.*

Ready-to-Eat Breakfast Cereal Made to Consist of Wheat Bran Cooked With Barley Malt Sprouts and Dried—*M. M. Raymer, Augusta, and J. J. Thompson, Battle Creek, to Kellogg Co., Battle Creek, Mich. No. 2,509,449. May 30, 1950.*

Bacon Packaged in Elongated Flexible Strip Provided With Space Folds to Serve as Pockets for Bacon Slices With Upper Edge Portions Exposed—*H. B. Reed, Chicago, F. W.*

How good can CHERRY FLAVOR be?
Well, counting fruit fresh from the tree,
For mixes, syrups, candies, cakes,
You'll take the cherry NORDA makes

Cherry flavor is very popular. Just how popular is it? Norda Cherry is likely to show you.

Norda Cherry Flavor can help make your cherry products the most popular products you sell.

Norda Cherry seems to have the extra *real cherry* taste of fresh-picked, plump, red fruit. There certainly is added flavoring power abundantly in Norda Cherry.

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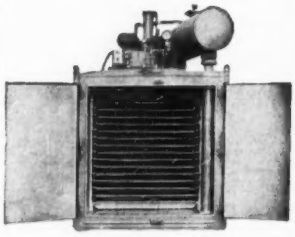
Amerio

CONTACT PLATE FREEZERS

(Patent Applied For)



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You can uniformly freeze Several Sizes of Packages in the one load.

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Unimpaired Quality - Tickles the Taste, and Repeats

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Contact Plate Freezers Inc.
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"It's the Contacts that Count"

Swanson, Park Ridge, and L. Peters, Evanston, Ill., to F. W. Swanson. No. 2,509,450. May 30, 1950.

Whole Kernels Removed From Ears of Green Corn By Mechanical Means—W. A. Robinson, Upton, Mass. No. 2,509,452. May 30, 1950.

Spent Absorbent Bleaching Material Used in Refining of Fats and Oils Treated for Recovery of Oxidized and Non-Oxidized Fatty and Non-Fatty Material Including Color Bodies—W. M. Leaders and W. Argue, Houston, Tex., to Swift & Co. No. 2,509,509. May 30, 1950.

Castor Oil Bean Cake Heat-Treated for 2 hr. at 110 to 115 deg. C. With Hydrochloric Acid Preparatory to Making Into Edible Product—E. le Breton and P. Gregory to Societe Organico, Paris, France. No. 2,509,511. May 30, 1950.

Fruits and Vegetables Packed and Shipped in Solid Water Ice With Melting Point Not Below 31 deg. F. and Containing Between 0.0001 and 0.1 Percent Fluorescein by Weight—J. N. Sharma, Los Angeles. No. 2,509,579. May 30, 1950.

Sulphur-Treated Vegetables Desulphurized by Heating in Closed System Equipped With Condenser to Provide for Return of Condensate and Escape of Volatile Vapors—M. P. P. Flanzy, Narbonne, France, to J. M. L. P. Fabre, Servian, France. No. 2,509,633. May 30, 1950.

Fruit Juices and Like Concentrated by Freezing and Volatilization of Moisture Under High Vacuum With Application of Heat Control to Keep Frozen Material in Plastic Condition and to Puff to Greater Than Initial Volume—E. W. Flosdorf, Forest Grove, Pa., to Tabor-Olney Corp., Baltimore, Md. No. 2,509,681. May 30, 1950.

Vegetable Tissues Blanched to Inactivate Enzyme Content, Partially Dehydrated, Treated With Plasticizing Agent, and Further Dehydrated—C. Birdseye to Dehydration, Inc., Gloucester, Mass. No. 2,509,719. May 30, 1950.

Apples Cored and Sliced in Machine Equipped With Vertically Mounted Rotary Spindle With Free Upper End for Impalement of Cored Apples and Plurality of Slicing Blades—J. W. Pease, deceased, by W. N. Pease, executrix, Rochester, N. Y. No. 2,509,781. May 30, 1950.

Citrus Fruit Product Made to Consist of Disintegrated Meat of Citrus Fruit Segments in Thick Suspension in Citrus Juice—J. A. Bruce, Tampa, Fla. No. 2,509,904. May 30, 1950.

Yeast-Raised Bakery Products Staling and Stiffening Retarded by Inclusion of Reaction Product of Polyhydroxy Compound and Alkylene Oxide—N. F. Johnston, East Norwalk, Conn., to People of United States by R. T. Vanderbilt Co., Inc., New York City. No. 2,509,926. May 30, 1950.

Bread Staling Retarded by Incorporation of Polyoxyethylene Monoester of Higher Fatty Acid—N. F. Johnston, East Norwalk, Conn., to People of United States by R. T. Vanderbilt Co., Inc., New York City. No. 2,509,927. May 30, 1950.

Hamburg Steak Patties Mechanically Formed and Packaged Between Sheets of Paper—F. S. Elsaesser, Cincinnati, O. No. 2,509,971. May 30, 1950. —End

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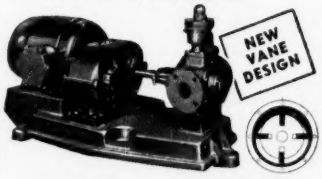
Handling costs are controllable . . . downward . . . with Blackmer Pumps and piping wherever liquid materials are used in processing or compounding. Power pumps from 5 to 1500 g.p.m. are sized for any requirement.



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Blackmer Hand Pumps promote safety, good housekeeping and economy.

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This slogan of Aqua Brand products is an invitation to enjoy a distinctive taste treat. Aqua fish products are carefully selected and delicately flavored . . . a sure way to add a "different" touch to any meal or special occasion.*

The closures used on these products are more than just ordinary closures, too. They're smartly decorated Crown Screw Caps with special features that make a big difference in sealing satisfaction . . . features like the patented Deep Hook Thread and special liners developed in Crown's own laboratories.

If you're looking for complete closure satisfaction . . . do as so many other packers do . . . bring your sealing problems to "sealing headquarters" . . . come to Crown. Crown Cork & Seal Co., Baltimore 3, Md. *World's Largest Makers of Metal Closures.*

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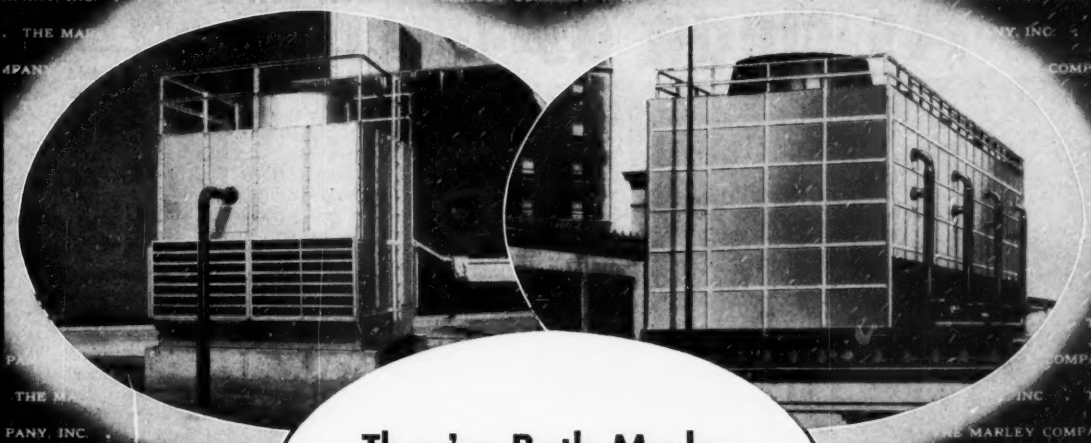
CROWN CLOSURES

Approved by Millions of Housewives



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Which Do You Need?

YOU want a cooling tower that will handle your water cooling job effectively at the least possible cost!

But, do you know which cooling tower will do it?

That's where Marley "know-how" fits into your picture. You have a water cooling job to do. There's a Marley designed and Marley built cooling tower to meet every water cooling need. Marley trained Application Engineers, working with you from the blue-print stage on, will help you get more for your money and assure complete, lasting satisfaction.

Shown above are two of the many Marley cooling towers from which Marley engineers can make a selection to fit your need:

The VAIRFLO (left) a medium capacity cooling tower with extra quality features at no extra cost. Vairflo extras include a balanced spray system with patented Marley low pressure nozzles . . . totally enclosed motor . . . grease packed ball bearings in enclosed bearing housing . . . lifetime nail-less filling . . . filling that is easily removed and installed . . . complete basin fixtures . . . Marley-designed cooling tower fan . . . multiple cells if desired . . . extra heavy framing and casing to give unusually long service. The Vairflo sets a new standard for air conditioning and refrigeration service. Available in wood or steel. Bulletin V-50.

The CONVENTIONAL (right) with a model to meet all heavy duty water cooling requirements. Only Marley Conventional towers offer all these features . . . rigid fan cylinders . . . cast aluminum or stainless steel fans . . . motors propery located outside the fan cylinder . . . positive drive action . . . drift eliminators independent of the distribution system . . . spray nozzle distribution . . . nail-less filling . . . independent louver posts . . . exclusive Marley mechanical equipment. Available in wood or steel. Asbestos board casing if desired. Bulletin C-50.

For guaranteed performance at lowest possible cost, ask a Marley Application Engineer to study your cooling requirements with you, from the blue-print stage on, and to give you a fair and impartial recommendation for the type of equipment that best meets your need. There's no cost nor obligation.

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Double-Flow Vairflo DriCooler Natural Draft Counter-Flow Aquatower Spray Nozzles

As clean as a dish

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WRITE FOR MULTI-COLOR DESCRIPTIVE BULLETIN

U.S. ELECTRICAL MOTORS Inc.

Atlantic Plant: Milford, Conn. • Pacific Plant: Los Angeles 54, Calif.

Glass Lines Do A-1 Job

—Continued from page 51

was as follows: Flush lines with cold water and circulate cleaner through them for 5 to 10 min. at 130 to 140 deg. F. This cleaning method remained the same throughout the experiment. Sanitization of these lines, however, was carried out in three ways—using heat, quaternary ammonium compounds, and chlorine.

The first method was to clean the lines as indicated above and then circulate water at above 180 deg. F. for a period of 5 to 10 min. The data obtained are shown in Table II.

Two different quaternary ammonium compounds were used, one at Cornell and one at Geneva. The concentration was as recommended by the manufacturers. Results are given in Table III. It should be noted that the bacterial counts are considerably higher when the quaternaries were used than when heat was used.

It was also noted that whenever a quaternary ammonium compound was employed for sanitization, a film built up in the lines within five to seven days and this had to be removed by using a sponge or an acid cleaner.

Table IV gives data obtained from the Cornell glass raw milk line when a 200-ppm. chlorine solution was used for sanitizing The bacterial counts here were low and the line looked clean and bright at all times

The 1½-in holding tube installed on the high-temperature, short-time pasteurizer (shown in illustration on first page) has been in use for over six months. During this period, the tube was never dismantled except for inspection purposes. The cleaning order, in conjunction with the HTST pasteurizer, read as follows: (1) Flush the machine with cold water; (2) circulate an acid cleaner for 30 min. at 160 deg. F.; (3) flush with hot water (160 deg. F.) for 5 min.; (4) circulate an alkaline solution for 20 to 30 min.; (5) flush with cold water; (6) circulate a cleaner-sanitizer solution (1 oz. to 10 gal. water) through the machine at 160 deg. F. for 20 min.; and (7) drain the machine.

Bacterial counts, obtained from the holding tube after this cleaning procedure was completed, are given in Table V. Condition of this holding tube was excellent, and in no case was there any evidence of bacterial build-up and no positive coliform tests were obtained from this line.

Samples of pasteurized milk were obtained at the Geneva plant, at the points where the milk entered and left the glass pipe, to determine if this pipe had any effect on the bacterial count

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Since we started using liquid sugar almost 15 years ago, we have been extremely pleased with the service we have received from Flo-Sweet. We have always found this service to be most dependable—from the time their engineers assisted us in making our liquid sugar installation, to the more recent run on sugar when their deliveries continued with the regularity that assures us of continued production of our beverages.

(Signed) Morris Kirsch, *President*
Kirsch's Beverages, Inc.

WHEN YOU USE FLO-SWEET® YOU GET SERVICE

Ask any Flo-Sweet customer—ask *every* Flo-Sweet customer—they'll all tell you, "Refined Syrups & Sugars have *never* let me down!"

That kind of service means you have no plant shutdowns, no lost orders, no disappointed customers.

That kind of service gives you better planning, greater economy, more repeat orders and larger profits.

HERE'S WHY FLO-SWEET MEANS SERVICE

1. Refined Syrups & Sugars is the largest liquid sugar manufacturer in the country—
2. has the industry's most complete production and storage facilities for liquid sugar—
3. maintains the largest number of tank-trucks, tank-cars, and tank-ships in liquid sugar service—
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5. Flo-Sweet production facilities are flexible to take care of the unusual in sugar requirements.
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For dollar-saving, product-sanitation and *always-reliable service*, you can't beat Flo-Sweet Liquid Sugars!

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NEW High Speed MIXER
Improves Food Processing

BATCH OR CONTINUOUS MIXING

Homogeneous mixing is now obtainable for food products in faster time . . . at less cost . . . with the "ENTOLETER" Mixer. Amazing savings have been effected in processing time. One company has been able to reduce its mixing cycle from 2 hours to ½ hour.

The saving in mixing time is usually accompanied by a smoother, more intimate mix, permitting improvement in product quality. The high-speed centrifugal action thoroughly disperses materials, producing a remarkably smooth textured product.

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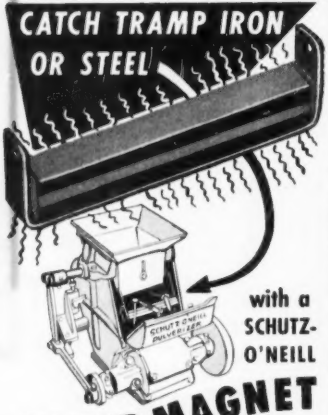

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Schutz-O'Neill powerful permanent SUPER-MAGNETS will be full strength 10 years from now. They will take iron or steel out of any dry product flow line. No power cost — no switch — SUPER-MAGNETS positively catch all nails, screws, bolts, wire, filings, etc. Saves your equipment, eliminates spark fire hazard, prevents metal contamination of your product.

Standard equipment on feeders for *Schutz-O'Neill Pulverizers* as shown above, SUPER-MAGNETS are adaptable to a great variety of applications. Write for literature.

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- Mechanical Atomizing Oil Burners
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of milk. The data are given in Table VI. Passage of milk through glass pipe apparently did not have any effect on the bacterial count and no positive coliform tests were obtained from any sample.

References

1. *Standard Methods for the Examination of Dairy Products.* 8th Ed. p. 126. 1941.
2. Hucker, G. J., and Thomas, R. E. "Pyrex Glass Tubing as a Substitute for Metal Milk Pipe in Dairy Plants." *Journal of Milk Technology*, V. 6, No. 4, 1943.
3. Laboratory Manual, *Methods of Analysis of Milk and Its Products*, p. 43, 1949.

End (Resume reading on page 52)

They Cut Use of Water

—Continued from page 53

instead of back washing after every 50,000 gal. of water, it is done every 75,000 gal. Saving adds up to an annual 450,000 gal. of wash water per unit, and there are two softeners used.

Another substantial saving is being made by shut-off nozzles on 50 hoses used for cleaning work throughout the brewery. With the old nozzles, the worker had to go all the way back to the valve end of the hose to turn the water off. In cleaning, say, a tank 200 ft. long, rather than walk 200 or 250 ft., a worker was more likely to leave the water running when he had to do something else for a few minutes. Now, all hoses have either automatic shut-off nozzles (called "water savers"), or brass valves with butterfly handles, enabling worker to shut off flow at nozzle end of hose.

Since this hose water is not metered, no accurate saving figure is available, but conservative estimates say this water use has been cut one-quarter.

Here is another uncalculated saving being made at Ruppert's: Each sprinkler system in the plant is tested by opening a small bypass connection at the main control valves, instead of opening the large valve at the end of the system. Tests are made weekly.

Not to be underestimated are bulletin board notices that advise all brewery workers that a water shortage exists and that every effort should be made to conserve it.

And not included in the 72,000,000-gal. saving just detailed—due to its being a special step taken before—is one other very important conservation measure. Jacket cooling water for all ammonia compressors is supplied from the cooling tower instead of city water.

The old cycle had ammonia compressor cooling water taken from city supply, run through the six compressors (four 260-ton, one 200-ton, and one 500-ton), and then discarded.

Now, the compressor jackets are

Uniform goodness
...the year around!

ARCHER Soybean Cooking Oils and Salad Oils aren't made in batches. Instead, these two outstanding oils are made by *continuous process.* That's the secret of dependable, uniform quality. Right now, in the refining towers of ADM's big, modern plant at Decatur, Illinois, a continuous, never-ending ribbon of soybean oil is being vacuum processed. This is the "last word" in chemical and mechanical quality control. That means that every shipment of ARCHER "S" and ARCHER "C" you receive will be just as clear, and just as bland as the last.

This year . . . next year . . . or the year after, you can count on ARCHER Salad and Cooking Oils. Deodorized and winterized, they'll always give your product the same, uniform, outstanding quality that has made the Archer name famous in the vegetable oil industry.

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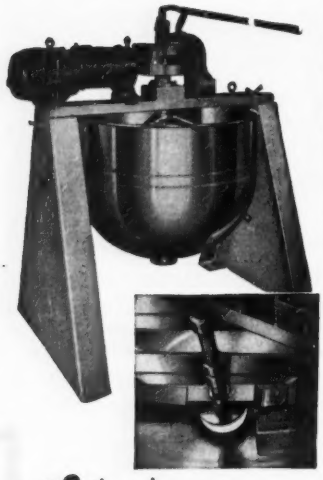

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POP the valve shut...
and this agitator keeps mixing all the while... DOUBLE MOTION!
(Valve diameter up to 6")

It's the newest in kettles...

The HAMILTON
Roto-Speed "MIX-COOKER"!

We believe it to be the finest steam-jacketed kettle for products which tend to settle or choke up. Cooks fast. Mixes thoroughly. Empties fast and clean. Operates at a touch. We'd like to tell you all about this "MIX-COOKER" for "problem products." Users are happy!

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one of the
ALVIN HOCK INDUSTRIES

tied in with the cooling water system for the steam condensing unit. In the steam unit, cold water from the cooling tower make-up tank is pumped through pipes surrounded by steam. The steam condenses, and the cooling water gets hot. The water is sent back to the cooling tower tank where it cools and is recirculated.

A pipe connection at the inlet end of the steam condensing unit enables pumping of water through both the ammonia compressors' jackets and the steam condenser at the same time. The outlet pipes from both meet, and the combined water is then carried back to the cooling tower make-up.

Water saved by this method comes to an average 45,000 gal. a day, or 16,500,000 gal. yearly.—*End* *(Resume reading on p. 54)*

Vegetables and Fruits

—Continued from page 46

Deficiencies occurring in dehydrated foods are not necessarily duplicated. However, slow reconstitution rates are common. Cut fruits such as peaches and apricots, whether sun-dried or dehydrated by artificial means, require two or more hours soaking for best results. Dehydrated diced beets, carrots, white potatoes, sweet potatoes, rutabagas require from 1½ to 2½ hours* total reconstitution and cooking time. Obviously, with the exception of fruits which can be eaten in dry form, such products cannot be easily used in the absence of kitchen facilities and hence are not suitable ration items for isolated servicemen.

Some reduction in reconstitution and cooking time is obtainable by cutting vegetables in thin slices rather than in dice or julienne strips. The relative acceptability and utility with respect to packing density, rehydration rate, and variety of uses of the sliced versus the other two forms needs further evaluation.

Non-enzymic browning limits the storage life of many dehydrated foods. Dehydrated cut peaches and apricots provide striking examples, being reduced to dark, bitter, unacceptable products in about two months at 100 deg. F. Treatment of dehydrated products with sulphur dioxide fumes or sulphite, reduction in moisture content, reduction in pH, and reduction in sugar content can provide partial control of browning.

Oxidation also takes its toll of dehydrated items in storage and leads to the development of objectionable flavors and loss of desirable properties. Carotene (provitamin A) losses are

*Army Cook TM 10-405

Here's Why it Pays You to Read the Advertising

The advertising is a rich source of valuable information. In this magazine it offers you ideas and products that may well apply advantageously to your business.

Every issue is a catalog of goods, materials, and services — quickly available to you—just for the reading.

Leaders in business and industry turn to the advertising because they've discovered it helps them run their businesses more profitably.

When you read all the ads in this magazine, the chances are good that you'll get a lead that will materially help you do a better job. For example, you may find a specific piece of equipment that will be a profitable time-saver. Or a tool that will increase worker efficiency. That's why it pays to read the advertising. It's good business.

HEADQUARTERS FOR BUSINESS INFORMATION

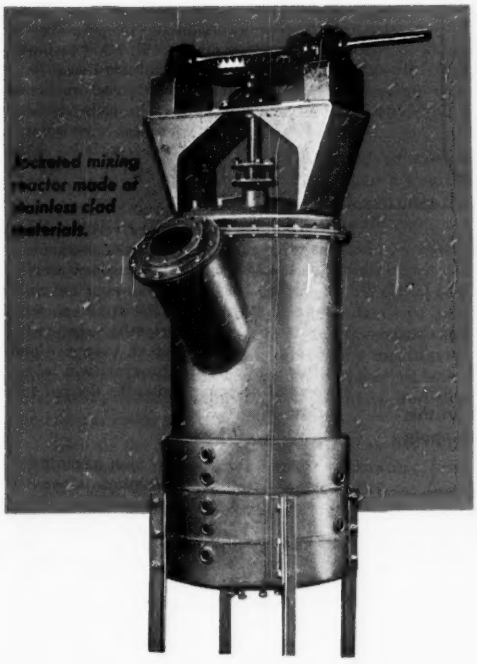
McGRAW-HILL publications

BACK IN THE 1880's

WHEN THE FIRST
KODAK CAMERA
WAS INVENTED

Koven

WAS MAKING INDIVIDUALIZED
FOOD EQUIPMENT



Jacketed mixing reactor made of stainless clad materials.

Jacketed revolving drum made of stainless steel.

L. O. KOVEN & BRO., INC.
154 Ogden Ave., Jersey City 7, N.J.

Plants: Jersey City, N. J. Dover N. J.

For more than 69 years, KOVEN has served the needs of America's vast food industry. Each KOVEN unit is individually built to solve a specific problem; thereby assuring more efficient and less costly production. Call or write KOVEN today. In our two vast plants are modern machine, welding, painting and galvanizing shops. X-ray inspection insures quality control.

The many KOVEN products in all commercial and noncorrosive metals include: Stainless Steel; Aluminum Sheet Fabrication; Boxes, Tote, Waste Cans; Chemical Apparatus; Coils and Pipe Bands; Copper Sheet Fabrication; Galvanizing Work; Mixers, All Kinds; Monel Metal Fabricators; Pails, Special Heavy; Pans, All Types, All Metals; Sinks, Scullery and Factory; Tables, Galvanized or Monel; Tanks, All Types, All Metals; Kettles, All Types, All Metals.

KOVEN FOR INDIVIDUALIZED FOOD EQUIPMENT SINCE 1881

LIFT OR LOWER—FLOOR TO FLOOR OR CONVEY HORIZONTALLY

MOVE boxes — cartons — crates — sacks and bundles from basement to first floor, or any floor to floor, or convey in a straight line — continuously with the Standard UTILITY BELT-VEYOR. A compact, pre-engineered unit, easy to install (over existing stairways where practical) handles commodities up to 150 lbs. — available in 4 belt widths — 10, 14, 20 and 24 inch — and equipped with adjustable guard rails to facilitate handling packages wider than belt. Electric motor operated. Write for Bulletin FI-100

Standard Conveyor Company
North St. Paul
Minnesota

Sales and Service in Principal Cities

Standard
GRAVITY & POWER
CONVEYORS

Here's Why it Pays You... to Read the Advertising

The advertising is a rich source of valuable information. In this magazine it offers you ideas and products that may well apply advantageously to your business.

Every issue is a catalog of goods, materials, and services – quickly available to you – just for the reading.

Leaders in business and industry turn to the advertising because they've discovered it helps them run their businesses more profitably.

When you read all the ads in this magazine, the chances are good that you'll get a lead that will materially help you do a better job. For example, you may find a specific piece of equipment that will be a profitable time-saver. Or a tool that will increase worker efficiency. That's why it pays to read the advertising. It's good business.

HEADQUARTERS FOR BUSINESS INFORMATION

McGRAW-HILL publications

F-23

common. The fat content of white potatoes is very low, but this fat is rich in highly unsaturated fatty acids that are very susceptible to atmospheric oxidation—particularly in cooked mashed potato items because of their finely divided state. Nitrogen-packing is beneficial in retarding these oxidative changes and is currently required for dehydrated carrots, cabbage, and mashed potato powder.

The merits of starch coating for the stabilization of carotene in dehydrated carrots are still somewhat controversial, although it is being used commercially to a considerable extent. Antioxidants are also potential means of control, although attempts to use them on carrots have not led to practicable applications.

Dehydrated cranberries are unusual among dehydrated fruits in that their acceptability is closely related to their ability to form gels, a property which they lose in a few months at high temperature storage. And no practical solution to this problem other than control of storage temperature is currently available. In other respects, they make one of the best items.

Dehydrated orange juice would be a welcome addition to many rations if a satisfactory product were obtainable. Products of initially high acceptability have been prepared in a number of laboratories, but stability is very poor. Browning, caking, and flavor deterioration are very rapid at high temperatures. Products examined at the Institute have remained acceptable at 100 deg. F. storage for only six to ten weeks. The apparent complexity of the deteriorative change involved suggests that an extensive and intensive research program will be required to bring about the desired improvements.

What It Takes

Much progress has been made in the last decade on the solution of similar problems through the combined efforts of research organizations and the food industry. New and improved products, processes, and control methods developed since 1940 are reflected in military specifications now used for procurement of fruits and vegetables. This is highly desirable, but it is essential that a thorough testing of the value and practicability of technical advances precede their incorporation in procurement documents.

The food industry can assist in the solution of present problems in two ways: First, through research aimed at their solution, in cooperation with the Institute and other research organizations; and, second, through evaluation of apparent solutions in terms of feasibility under production conditions.

End *(Resume reading on p. 47)*

Announcing the NEW

JENKINS SWINGTITE

with an exclusive new design that assures smooth action, positive closure, and longer life

Fast-Action Bronze Gate Valve

In the new Jenkins SWINGTITE Fast-Action Bronze Gate Valve, the exclusive rolling disc and guide track design lengthens valve life and assures maximum tightness as it prevents uneven wear of seating surfaces. As the valve is opened or closed, guide rims around the seating surfaces of discs roll freely over guide tracks cast in the body, distributing wear evenly, dislodging foreign matter, and providing a polishing action for seating surfaces.

The SWINGTITE can be opened or closed instantaneously and easily with less than a quarter turn of the malleable iron lever which activates the self-adjusting ball and socket type double disc.

Wherever full, free flow is essential . . . where valve opening or closing must be instantaneous . . . you will see more and more Jenkins SWINGTITE Bronze Gate Valves setting new standards of performance and endurance. They are recommended especially for such services as laundry machinery, dish-washing equipment, gasoline and fuel oil lines, fire extinguishing steam lines in kitchens, and dispensing lines to tanks or vats.

Get all the facts on the new Jenkins SWINGTITE. Find out how much smoother-operating, how much *longer-lasting* these fast-action Bronze Gate Valves can be when *Jenkins* builds them. Send for the new folder, Form No. 196, containing full details. Jenkins Bros., 100 Park Avenue, New York 17, N.Y. Jenkins Bros., Ltd., Montreal.

Sold through leading Industrial Distributors

NO OTHER VALVE of its type HAS THIS FEATURE

Notice the guide rims (A) of the discs which rotate freely on the guide tracks (B) cast in the body, as the valve opens or closes. This roller action provides a self-cleaning and polishing effect, and also distributes the wear, since the seating position of the discs changes with each closing. Rapid, uneven wear is prevented, and continuous tight closure assured.

JENKINS VALVES

LOOK FOR THE DIAMOND MARK

SINCE 1864 TRADE JENKINS MARK

Jenkins Bros.

AUTO-LITE

TEMPERATURE INDICATORS

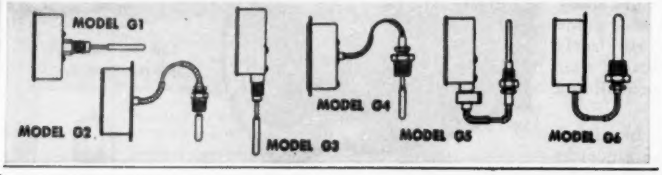
For your specific needs!

- ★ Precision-built indicators provide accurate temperature readings.
- ★ Low-cost protection . . . due to large, specialized production.
- ★ Wide selection of dial ranges to meet specific requirements.
- ★ 6 stock types available as shown.

MODEL "G"

Select the type that is best for your purpose. 3½" dial; evenly calibrated scales. From $18 up.

THE ELECTRIC AUTO-LITE COMPANY
INSTRUMENT AND GAUGE DIVISION DEPT. F
TOLEDO 1, OHIO
NEW YORK • CHICAGO • SARNIA, ONTARIO



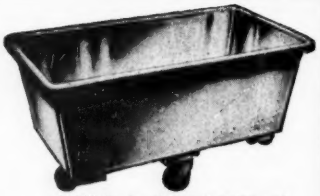
STANcase
STAINLESS STEEL
EQUIPMENT

SANITARY
STAINLESS STEEL
FOOD HANDLING EQUIPMENT

Illustrated are three units of STANcase STAINLESS STEEL EQUIPMENT which have wide application in all types of food processing plants. Economy dictates their adoption for all operations which require sanitary control and where it is necessary to protect quality and flavor of products.

The units illustrated are standard STANcase items which we manufacture to highest quality-specifications with production-line economy.

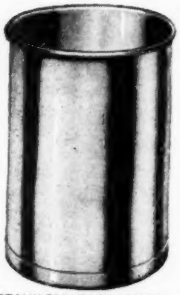
WRITE FOR DESCRIPTIVE LITERATURE



TRUCK No. 18—of 14 ga. Stainless Steel. Inside dimensions: 43½" x 22¼" x 16" deep. Three other popular sizes available.

STAINLESS STEEL TUB

Inside Dimensions: Top 19", Bottom 16", Depth 13¾". Maintained sparklingly clean and sanitary with minimum labor.



STAINLESS STEEL DRUMS

Ruggedly constructed of 16 ga. Stainless Steel. TWO SIZES: 30 gal. and 55 gal. capacities. Covers available.

FULLY APPROVED BY HEALTH AUTHORITIES

Manufactured by

THE STANDARD CASING CO., Inc., 121 Spring St., New York 12, N. Y.

Needn't Break Lots

—Continued from page 79

Cost of mechanical changes was approximately $1,200 per line. Despite this expense, the interlocking case offers significant savings over the preceding triple-case. The new case reduces the cost of materials to $8 per 1,000.

By eliminating the old triple case's duplication of gluing, sealing, and printing operations for inner cartons and the shipping container, the new case halves the amount of equipment needed. Also, the new case eliminates one operator on each line, thereby resulting in a saving of about $20 per 16-hour day. Further, it reduces the amount of ink and glue, also the storage space for knocked-down shipping cases. The total saving here runs to 50 percent. And finally, the interlocking case represents a 10-oz. reduction in gross weight for each case—a substantial freight savings.

As a further aid to the retailer, the company has devised a special jackknife type case opener with a hooked blade at one end and a guide at the other.—*End (Resume reading on p. 80)*

Save Boiler Dollars

—Continued from page 64

the water level in the boiler lowers, the first cutoff starts one of two condensate return pumps. The second low-water switches energize the second condensate return pump. If the water level continues to fall, a separate Mercoid in the first cutoff opens the induction draft blower circuit. And if for any unanticipated reason the water level continues to fall, the second low-level control opens the pilot circuit of the oil burner.

4. Draft Fan Cut-Out. The fourth contact on the induced draft blower motor starting switch is also in the pilot circuit of the oil burner as a safety factor. The burner cannot run unless the induction draft blower motor is connected, electrically and mechanically.

After the installation was in operation, we discovered an unexpected safety element in the system. If the burner should stop, because of low gas pressure, clogged oil line or empty oil tank, the induced draft blower motor continues to run, but the watts increase about 50 percent. This is the load difference between air and the products of combustion. The thermal overload protector stops the blower motor within 5 minutes.

An induced draft blower requires more power than a forced draft blower.

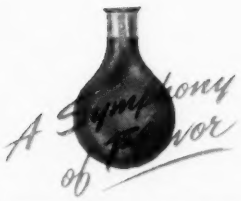
The Taste of Sunshine—All the Time

ROYAL SOLUBLE SEASONINGS

ROYAL SOLUBLE SEASONINGS are truly distinctive—in flavor potency, purity and uniformity! Griffith has conquered the disturbing elements in nature! . . . eliminated the flavor variations in spices! And changed spice blending from an art to a science—with predictable, dependable results for spice users.

The secret to this new, high standard in flavor quality lies in Griffith's revolutionary extraction process.* It *removes* the disturbing strains in flavor . . . *captures and measures* the full potency of "true" flavors in spices.

Use ROYAL SOLUBLE SEASONINGS and improve your products with *the taste of sunshine, all the time.* Write today.



PEPPEROYAL and all ROYAL SOLUBLE SEASONINGS derived from Griffith's new extraction process.* Formulae tested for that "taste of sunshine" in Griffith's model production kitchen.

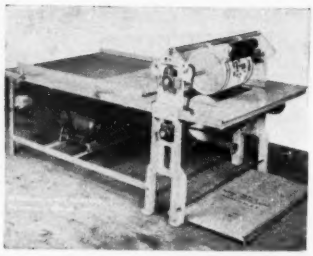
*(Patents Applied For)

The GRIFFITH LABORATORIES, Inc.

In Canada—The Griffith Laboratories, Ltd.

CHICAGO 9, 1415 W. 37th St. • NEWARK 5, 37 Empire St. • LOS ANGELES 58, 4900 Gifford Ave. • TORONTO 2, 115 George St.

Print your own Multi-Wall Bags



as you need them—with this economical

• AUTO-PRINTER •

Now you can reduce inventory costs and storage problems on pre-printed bags—by printing bags as needed with this rapid, simple automatic motorized machine. Faster, cheaper, better than hand stenciling. No more poor marking. Hours gained; trouble eliminated. Send data on sizes of bags, printed area, sides, or samples, for our quotations.

A FEW FEATURES

- Can imprint 2400 bags an hour.
- Resilient interchangeable rubber type.
- Self-inking reservoir.
- No "make-ready" needed.
- Adjustable for various sizes.
- Spring-loaded pressure roller takes various thicknesses.
- Units available to imprint loaded and flat corrugated boxes (example: Borden Powdered Milk).
- Users: Carbide & Carbon Chemical, Liggett & Myers, American Tobacco, General Mills, A. E. Staley.
- Price (approximate) $2,000 F.O.B.

THE *Industrial* MARKING EQUIPMENT COMPANY INC.
7 EAST 48th STREET · NEW YORK 17, N. Y.
PHONE PLAZA 3-4644

IME

Designers and Builders of MARKING EQUIPMENT FOR INDUSTRY
PLANT
454 BALTIC STREET
BROOKLYN 17, N. Y.
MAIN 4-8515

SLOGS stops SLIPS!

WEAR SLOGS OVER BOOTS OR SHOES

USED IN BIG FOOD PLANTS

At last, a "sandal" made of non-abrasive, long wearing special COTTON DUCK.

In actual use, proved INVALUABLE where wet slippery floors or other surfaces make walking unsafe. Easy to put on; comfortable; adjustable to all sizes. Give double wear, because reversible. Improved personnel efficiency. The daily cost of SLOGS is so small, their safety so great, you can't afford to be without them!

NON SKID ON SLIPPERY WET FLOORS

Save Wear on Boots

BELLEROSE PRODUCTS CO.
24 Kerwin Place Tarrytown, New York

$4.55 *per pair*
1 to 5 DOZEN PAIR
$3.95 *per pair*
DISCOUNTS ON LARGER QUANTITIES

The slightly higher operating cost resulting is offset by a greater safety factor. Also by other advantages. If the ignition system should fail, allowing raw oil to be sprayed into the combustion chamber, the induced draft blower reduces pressure in the boiler. It sucks in such a large volume of air that a combustible mixture is unlikely and an explosion remote. With forced draft, the fuel and air mixture supplied is blended for correct combustion. Hence, the explosion hazard is greater.

The friction loss in an induction draft blower is such that unless there is an appreciable chimney draft there is little change in combustion chamber pressure. The shorter the stack the less the pressure change. Hence, an elaborate motorized damper control is unnecessary. These controls are often used with forced draft blowers. The induced draft blower functions best if the flue is restricted enough to produce slight positive pressure in discharge.

The negative pressure control is a simple plant constructed device. It consists of a surge reducer, a 3-ft. length of 2-in. pipe, capped at the bottom, and for control has a Mercoid flue pressure switch. For the lead from the combustion chamber to the surge reducer and instruments, ⅛ in. piping is sufficient.

Orifice Solves a Problem

When this arrangement was first adopted it was not effective. The initial burst of flame caused an instant of positive pressure in the combustion chamber and the control instrument stopped the burner. Introducing an orifice in the pipe leading to the surge reducer and instrument corrected this.

The orifice, a hole of about 3/32 in. dia., was drilled in a disk of thin sheet copper. The disk was cut to size and fitted as a washer in the union in the line between the combustion chamber and the surge reducer. After the orifice was installed in the line, the instant of pressure no longer affected the instrument before the return of negative pressure in the combustion chamber. However, if the positive pressure continues, even for a few seconds, the control becomes operative and stops the burner.

Proper air accommodation in the boiler room is a safety measure often overlooked. Anyone familiar with combustion knows that a large volume of free flowing air is necessary. Nevertheless, many boiler rooms are so tight, when doors and windows are closed, that air in sufficient volume for combustion cannot enter. This condition can be avoided by a roof ventilator of ample capacity and so constructed that it cannot be closed.—*End* *(Resume reading on p. 65)*

Old Mother Hubbard
went to the cupboard
to get her poor dog a bone
but when she got there...

...the cupboard was bare!

. . . but not today! It's stacked . . . and the refrigerator, too . . . full of canned, bottled and packaged products of the Canning, Preserving and Freezing Industry. Everything . . . from soup to nuts, from pork and beans to raspberry jam and frozen peas . . . today's cupboards are stocked with a sumptuous and varied diet.

CANNING, PRESERVING AND FREEZING . . . produce $2.5 BILLION of foodstuffs annually. A vast industry. Yet, it is only a segment of the much larger and essentially homogeneous $33 BILLION FOOD PROCESSING BUSINESS. Food manufacturing, with its diverse products and uniform operations, is ONE INDUSTRY . . . for its problems are basic and solutions require kindred methods, materials and machinery.

Food Processing is one of the livest and broadest markets for industrial goods and services of all kinds . . . more plants, greater capital expenditures and a larger value of product than any other single industry in America! And you can tap this market . . . directly and effectively by advertising in the magazine which has complete horizontal coverage of the entire field . . . FOOD INDUSTRIES.

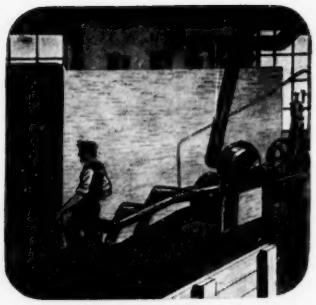
SO . . . FILL YOUR CUPBOARD WITH ORDERS . . . Tell your story to the real buyers in food plants . . . those reached exclusively by FOOD INDUSTRIES.

Food Industries

A McGRAW-HILL PUBLICATION

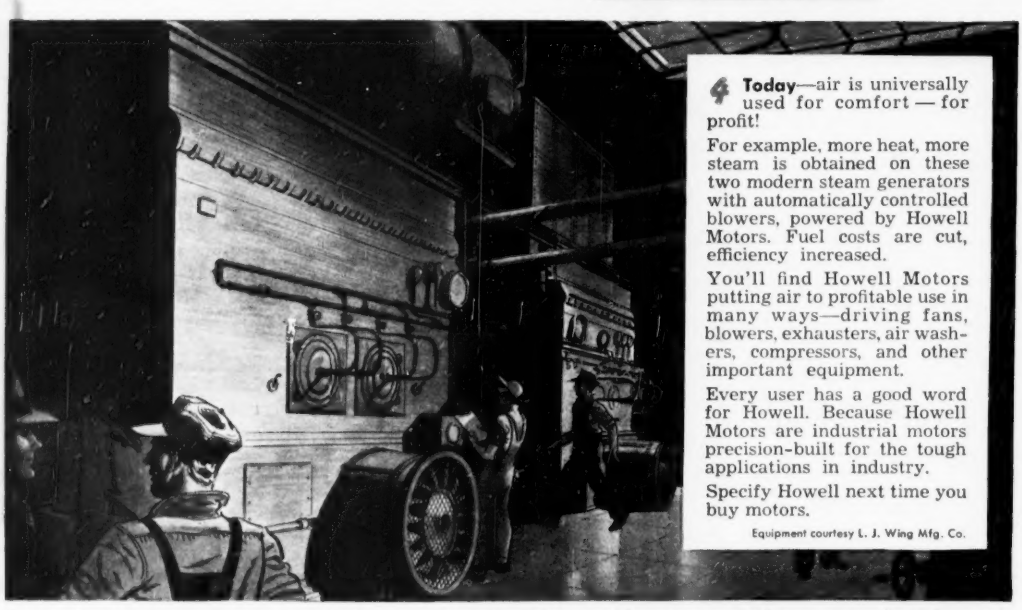
1 **1561**—A crude, manually operated bellows like this was used in an attempt to pump fresh air into a mine in Switzerland. And man's quest for comfort, by putting air to work, was under way.

2 **1700**—This age-old method of moving air for its cooling effect was used in many parts of the world. Needed was a form of low-cost power that would move air mechanically, automatically, and efficiently.



3 **1873**—This steam-operated, forced draft fan promoted efficient burning of fuel in boilers. By 1915, Howell Electric Motors arrived. The era of electrical power put the handling of air on a paying basis.

NOW... AIR IS PUT TO PROFITABLE USE!



4 **Today**—air is universally used for comfort — for profit!

For example, more heat, more steam is obtained on these two modern steam generators with automatically controlled blowers, powered by Howell Motors. Fuel costs are cut, efficiency increased.

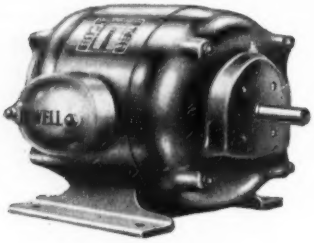
You'll find Howell Motors putting air to profitable use in many ways—driving fans, blowers, exhausters, air washers, compressors, and other important equipment.

Every user has a good word for Howell. Because Howell Motors are industrial motors precision-built for the tough applications in industry.

Specify Howell next time you buy motors.

Equipment courtesy L. J. Wing Mfg. Co.

Free enterprise encourages mass production, supplies more jobs—provides more goods for more people at less cost.



Howell Protected-Type Motor

HOWELL MOTORS

HOWELL ELECTRIC MOTORS CO., HOWELL, MICH.

Precision-built Industrial Motors Since 1915

HOWELL Red Band MOTORS

Serving Industry... which Serves Mankind

MONSANTO CHEMICALS PLASTICS

NEW LABORATORY SERVICE FOR FOOD INDUSTRY

A food technology laboratory recently was established at Anniston, Ala., by Monsanto Chemical Company. This laboratory, staffed by capable technologists, is conducting continuous research into the growing application of chemistry to foods. Perhaps this laboratory can help you with some of your problems.

GROWING IMPORTANCE OF CHEMISTRY IN FOODS

Chemistry is gaining in importance to the food industry, contributing to virtually every improvement in leavening, food fortification and food preservation. Monsanto, which serves the food industry with nearly half a hundred chemicals, already has made many advancements in the applications of chemicals to foods. The new laboratory was established by Monsanto primarily to determine where chemicals can *improve the quality* and nutritive value of foods. A few of the many operations in the Monsanto laboratory are illustrated here.

STUDYING RANCIDITY IN CEREAL PRODUCTS

T. W. Schilb, who has charge of Monsanto's food technology laboratory, is shown using the "Rancimeter" to evaluate rancidity development in cereal products.

LEADER IN LEAVENING FOR MANY YEARS

For many years, Monsanto has been a leader both in research and in manufacturing of phosphates for leavening. Among Monsanto products that are widely used as leavening agents for baked goods are: Sodium acid pyrophosphate and mono calcium phosphate. Recently, Monsanto has developed sodium acid pyrophosphate, MD grade, designed especially for machine-made cake doughnuts. The above photo shows Baking Chemist Elizabeth McKim and Mr. Schilb scoring chemically leavened baked products.

TAKING THE FOAM FROM FERMENTATION

Where fermentation foam is a problem, Monsanto's foam inhibitor, AE-1, can be a chemical servant of the food industry. In the illustration at the left, Dr. Roy E. Morse, of Monsanto's food technology laboratory, measures the foam of aerated fermentation that contains no inhibitor. At the right, you see how foam vanishes before Monsanto's AE-1.

LITERATURE FREE UPON REQUEST

Monsanto literature, describing chemicals for the food industry, is worth-while reading if you are interested in the production of quality products. These pieces contain technical data of value to the food industry. Any or all of them will be sent free upon request. The coupon below is for your convenience.

TALK OVER YOUR PROBLEM WITH MONSANTO CHEMISTS

If you have a problem in food technology, you are invited to bring it to Monsanto. Our food technologists may have a solution for you. For details, mail the coupon or contact the nearest Monsanto Sales Office. MONSANTO CHEMICAL COMPANY, Phosphate Division, 1737-J South Second Street, St. Louis 4, Missouri.

Ethavan: Reg. U. S. Pat. Off.

DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

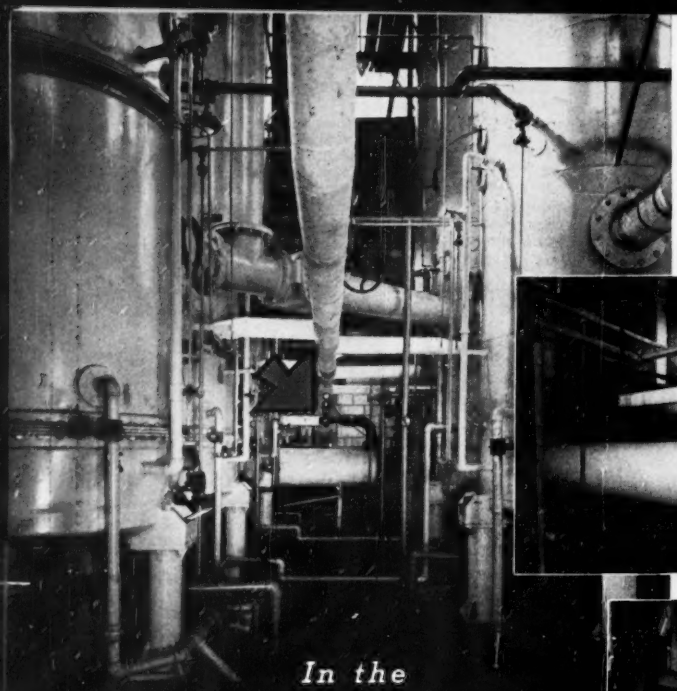
MONSANTO CHEMICALS PLASTICS

MONSANTO CHEMICAL COMPANY
Phosphate Division
1737-J South Second Street, St. Louis 4, Missouri

Please send literature as indicated: ☐ Booklet, "Food Production, Preparation, Preservation"; ☐ Folder, "Sodium Acid Pyrophosphate, MD grade"; ☐ Folder, "Preserving with Monsanto Sodium Benzoate"; ☐ Folder, "Ethavan"; ☐ Folder, "Vanillin"; ☐ Folder, "Coumarin"; ☐ Folder, "Saccharin"; ☐ Folder, "Methyl Salicylate"; ☐ Details on food laboratory service.

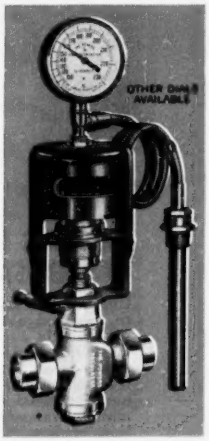
Name.....Title.....
Company.....
Street.....
City.....Zone.....State.....

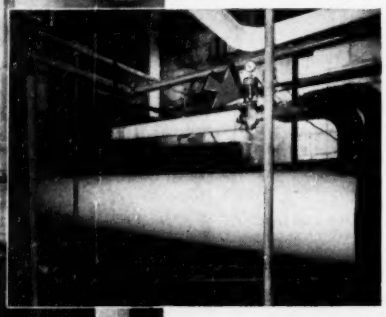
SERVING INDUSTRY...WHICH SERVES MANKIND

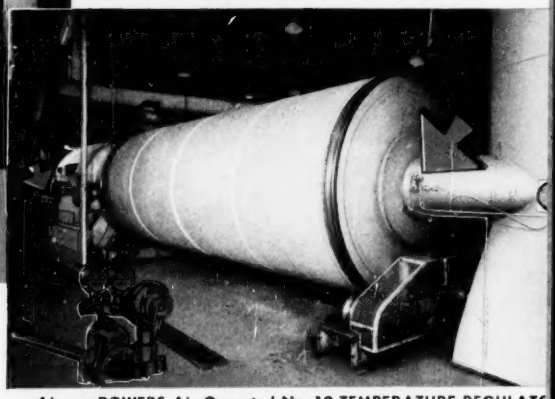


In the
Minute Maid Corp.
Plant at Leesburg, Florida

POWERS No. 11 Self-Operating TEMPERATURE INDICATING REGULATOR. Has easy to read 4" dial correctly gives temperature of pulp and liquid being heated before entering evaporators. Regulator valve controls steam supply to large heater shown below.







POWERS TEMPERATURE CONTROL

Helps Regulate Processing of Citrus Fruit By-Products for Animal Feeds

FUEL and LABOR SAVINGS are obtained in this efficiently managed plant of the Minute Maid Corp., by preventing losses of OVER-heating with Powers automatic control. Constant uniform temperatures also help to produce a more uniform quality product.

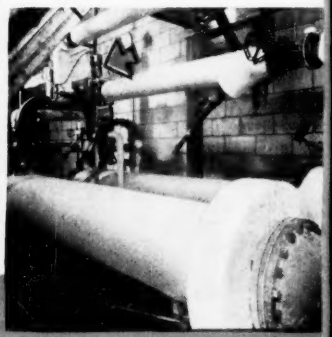
If you want to maintain any process or air conditioning equipment at a more constant uniform temperature or humidity, contact your nearest POWERS office for help in selecting the right control for your requirements.

With almost 60 years of experience and a wide variety of pneumatic and self-operated regulators POWERS engineers are well qualified to help you get the most value for your money. Phone our nearest office or write—

(MMC)

Above: POWERS Air Operated No. 10 TEMPERATURE REGULATOR controlling valves on Oil Burners and Dampers HEIL CO. ROTARY DRYER.

Below:
POWERS No. 11 Self-Operated TEMPERATURE REGULATOR automatically controlling steam supply to large double cylinder heater.



THE POWERS REGULATOR CO.

OVER 59 YEARS OF AUTOMATIC TEMPERATURE CONTROL • OFFICES IN OVER 50 CITIES • SEE YOUR PHONE BOOK

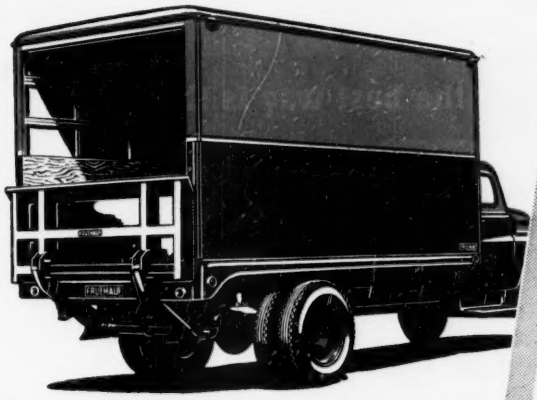
CHICAGO 14, Ill., 2793 Greenview Ave. • NEW YORK 17, N. Y., 231 E. 46th St. • LOS ANGELES 5, CAL., 1808 W. Eight St. • TORONTO, ONT., 195 Spadina Ave.

SAVE on TRUCK BODIES

All-Steel "Unit-Built" FRUEHAUFS

NOW AS LOW AS $622.00 Taxes Extra

PAINTED, MOUNTED
READY TO DRIVE AWAY

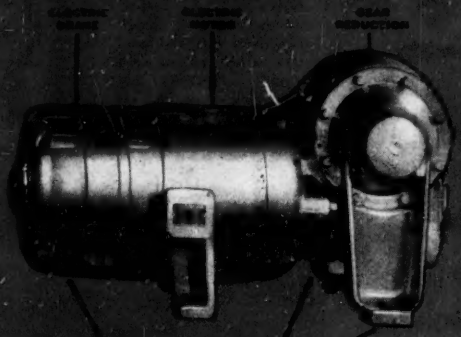


Typical of the outstanding *buys* at Fruehauf Branches today is this 12-ft. all steel, open rear end, straight-frame body. Complete—mounted on chassis, painted to match cab—ALL FOR ONLY $622. Taxes extra. (Elevating end gate — illustrated — optional.)

World's Largest Builders of Truck-Trailers
FRUEHAUF TRAILER COMPANY
DETROIT 32 • LOS ANGELES 58
IN CANADA: WESTON, ONTARIO

Save on
FRUEHAUF ELEVATING END-GATES
NOW $378.00*
*Freight, taxes and installation extra
They lift your loads at the touch of a finger!

FRUEHAUF *Service* "PAYS OFF"



The best way to power any application is to secure, in one compact unit, the RIGHT horsepower, the RIGHT shaft speed, the RIGHT features that you can use RIGHT where you want it. It's the best way and the easiest way because you purchase one unit, handle one unit in your receiving, production, and maintenance departments . . . set one unit in place and you're ready to go.

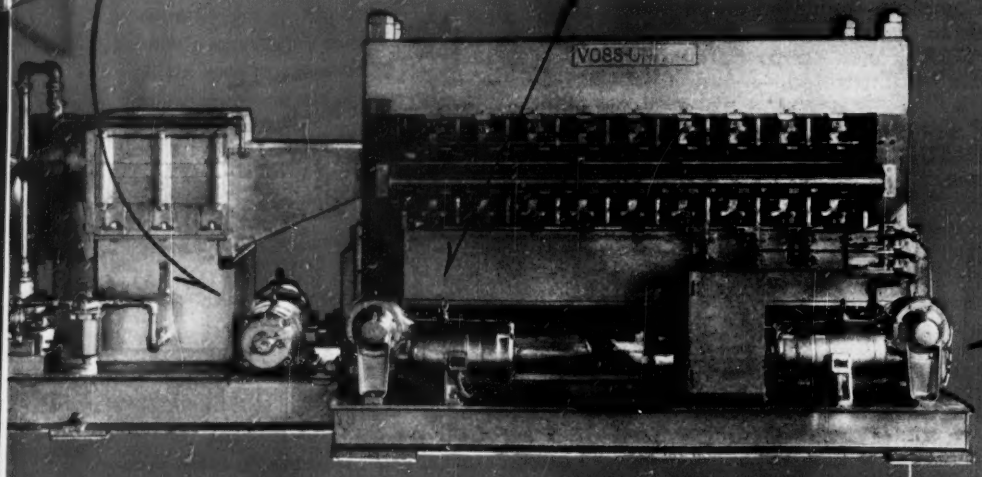
Master Motors, available in thousands and thousands of types and ratings (up to 150 HP) give you an enormous selection of integrally built power drives from which you can easily select the combination of features that's just right for each job.

the best way is the easiest way

Open, enclosed, splash proof, fan-cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 432 to 1 ratio . . . with electric brakes . . . with mechanical variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best motor drive for YOU.

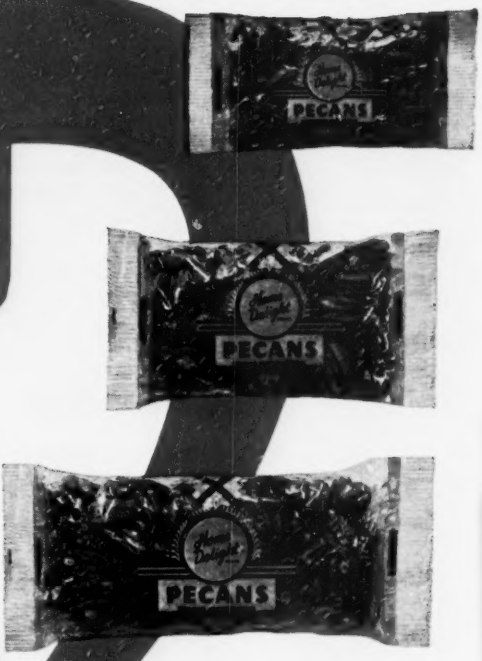
Select the RIGHT power drive from Master's broad line and you can increase the saleability of your motor driven products . . . improve the economy and productivity of your plant equipment.

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO

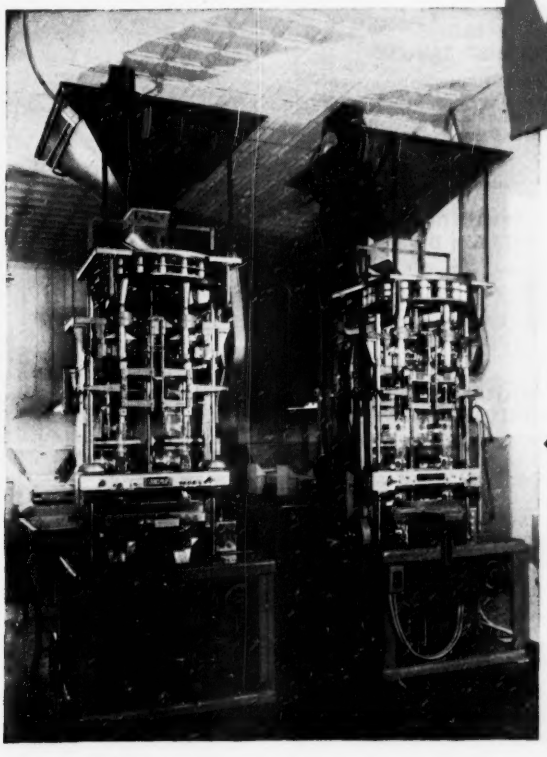


Safeguard PURITY

WITH STOKESWRAP



A STOKESWRAP package gives "eye appeal" plus "protection" to this product. It's good to look at, and when it's opened, the Pecans are fresh as the day they were packed. Stokeswrap gives "profitable packaging" with "sales appeal" to many products such as candies, nuts, cookies, coffee, etc.



The Stokeswrap Automatic Packaging Machine is capable of up to 3600 packages per hour, using cellophane or other heat sealing films from the roll. The Stokeswrap automatically makes the bag, fills and heat seals at one operation.
Let us show you how it can lower your Packaging cost. Write for complete information.

STOKESWRAP installation at Guadalupe *Valley Pecan Company, San Antonio, Texas.*

Exclusive West Coast Distributor:
Anderson-Barngrover Division of FMC
San Jose 5, California

STOKES & SMITH Co
PACKAGING MACHINERY **PAPER BOX MACHINERY**
Subsidiary of Food Machinery and Chemical Corporation
FRANKFORD • PHILADELPHIA 24 • PA.
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Sterling-Winthrop Research Institute serving Sterwin Chemicals Inc.

Sterwin

HELPS YOU PRODUCE BETTER FOOD PRODUCTS

Easily . . . Accurately . . . Economically

STERWIN CHEMICALS, backed by the extensive manufacturing and research facilities of the entire Sterling Drug organization, is continually striving to supply food processors with modern products and methods that will aid in the production of *better* food products *easily*, *accurately* and *economically*.

Contributions to the Food Industry by Sterwin products have been many. Outstanding among them are, we believe, the following famous products . . . each a *first* in its field:

FIRST

LIGNIN VANILLIN MADE IN UNITED STATES!

ZIMCO® Pure Lignin Vanillin U.S.P. Made by world's largest Vanillin manufacturer. Preferred by leading flavor suppliers and manufacturers of confections, ice cream, baked goods, soft drinks and other foods.

FIRST

BREAD-ENRICHMENT TABLETS!

B-E-T-S® Enabled bakers to comply promptly with War Food Order No. 1. This tablet method has made enrichment in the bakery both practical and economical . . . saving bakers many millions of dollars.

FIRST

LOW-ASH FOOD ENRICHMENT MIXTURE!

VEXTRAM® The original starch base enrichment mixture. Keeps market value of enriched flour up by keeping the ash content low. Free-flowing . . . uniform . . . stable.

FIRST

SYNTHETIC VITAMIN D_3!

TRIDEE® The form of Vitamin D which has the greatest antirachitic value in poultry. D_3 is also used for fortification of evaporated milk and other food products.

FIRST

QUATERNARY AMMONIUM GERMICIDE!

ROCCAL® A powerful germicide that may be used for every equipment sanitizing job throughout the Food Industry.

FIRST

WATER MISCIBLE, CRYSTALLINE VITAMIN D_2!

DELTAXIN® The purest known form of Vitamin D_2. For fortification of milk, bread and other food products.

OTHER STERWIN PRODUCTS FOR THE FOOD INDUSTRY

OXYLITE®—A highly efficient and economical flour bleaching agent. Endorsed by millers in every flour producing state.

PARAKEET—Brand of Certified Food Colors—adds eye and sales appeal to all types of food products.

RIBOFLAVIN MIXTURE—For fortification of poultry feeds to increase egg production, aid growth and hatchability.

STERWIN'S BROMATE MIX—A free-flowing maturing agent that is easy to handle and blend with flour.

U. S. P. VITAMINS AND AMINO ACIDS IN BULK

Call the Sterwin Technically-Trained Representative in your area for information on practical application of these products in your plant. Write for free copy of our latest catalog.

BRANCH OFFICES: Atlanta, Boston, Buffalo, Chicago, Dallas, Kansas City (Mo.), Los Angeles, Minneapolis, Portland (Ore.), St. Louis.

Sterwin Chemicals INC.

Subsidiary of Sterling Drug Inc.
1450 BROADWAY, NEW YORK 18, NEW YORK

Pioneers in Food Enrichment

Distributor of the products formerly sold by Special-Markets-Industrial Division of Winthrop-Stearns Inc., and Vanillin Division of General Drug Company.

. . . in at 165°F. . . . out at 28°F.

that's how this Stainless Steel milk cooler handles ice cream mix

9300 pounds of ice cream mix is cooled per hour in this big Stainless Steel cooler. It was fabricated by the Tolan Machinery Company, Newark, N. J., for the Country Club Ice Cream Company, Paterson, N. J.

ICE CREAM MIX enters this cooler from the pasteurizer at 165°F., passes over the cooler unit and flows out the bottom at 28°F., *10 degrees lower than with other cooling methods.* Much of the credit for this wide temperature drop and the resulting saving of freezing time can be credited to the use of Stainless Steel.

Increased refrigerating efficiency is only one of the benefits of using Stainless Steel in an application like this. Long life is another. Stainless won't pit or crack; there's no plating to wear away. The goodness of Stainless goes all the way through.

And don't overlook the unmatched cleanliness of Stainless Steel where food products are concerned. Stainless is easy to clean and keep clean. It will not react with food products to cause spoilage and decomposition. It doesn't affect the flavor. It's the most sanitary construction you can use.

You'll add to the efficiency of many kinds of equipment by making it from Stainless Steel—especially if U·S·S Stainless Steel is used. This perfected, service-tested material is available in the widest range of forms, grades and finishes. It permits the widest latitude in design and allows the use of the most modern fabricating techniques.

For the finest in Stainless performance, use the best in Stainless Steel—U·S·S Stainless Steel.

AMERICAN STEEL & WIRE COMPANY, CLEVELAND · CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH · TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

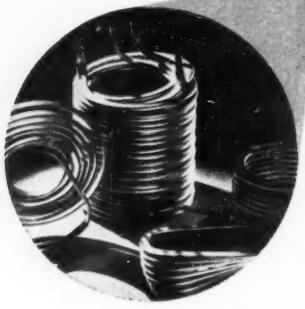
U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

0-1650

UNITED STATES STEEL

WHICH TRENTWELD TUBING FITS YOUR NEEDS?



full finished tubing and pipe sizes

large diameter tubing

ornamental tubing

beverage tubing

Whatever your industrial requirement . . . pressure tubing, stock line tubing, decorative tubing, cooling coils, sanitary beverage tubing . . . the complete TRENTWELD line of quality stainless and high alloy tubing is your best bet! TRENTWELD is made in a *tube* mill by *tube* engineers . . . and is designed for rugged dependability, long life and economical service.

Trent Tube Company *specializes* in the production of stainless and high alloy tubing . . . and that means you get expert advice on applying TRENTWELD to your needs. And you get fast service on delivery because of Trent's convenient mid-continent location. You're assured of finding what you need . . . the complete TRENTWELD line ranges from $\frac{1}{8}$″ to 30″ diameter inclusive.

To meet your stainless or high alloy tubing requirements . . . better . . . TRY TRENTWELD! Write for TRENTWELD Data Bulletin.

TRENT TUBE COMPANY
Subsidiary of Crucible Steel Company of America
General Offices and Plant: East Troy, Wisconsin
Sales offices in principal cities

TRENTWELD

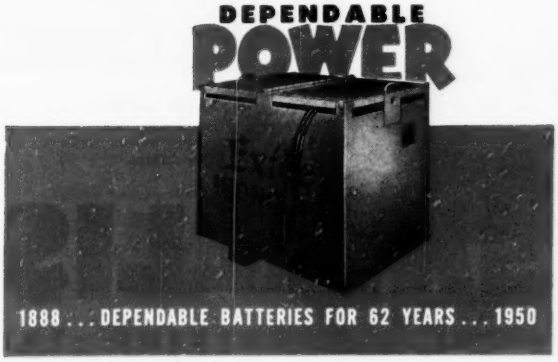
STAINLESS STEEL TUBING

You get Split-second Handling with

Exide-Ironclad battery-POWER

Dependable Exide-Ironclad Battery power is your assurance of finger-tip control, accurate spotting, and steady operation of electric materials-handling trucks. Whether the load is light or heavy, Exide-Ironclads will deliver power instantly to meet all demands typical of *start-stop*, *lift* and *shift* manipulations of materials-handling trucks.

Exide-Ironclad Batteries assure full-shift trucking operations (around the clock or calendar) with no unscheduled periods of down-time to interrupt the flow of materials through your factory or warehousing operations.



The Exide-Ironclad Battery is *DIFFERENT* from all other batteries . . . different in design, construction and performance. The main difference is the Exide-Ironclad positive plate, which accounts for the superior operating characteristics and the exceptional long-life of Exide-Ironclad Batteries in more than a hundred thousand rough, heavy-duty jobs since 1910.

The operating cost of an Exide-Ironclad is low . . . a battery of average size costing less than a nickel per hour to recharge. Maintenance costs seldom exceed fifteen cents per shift. These important factors, together with the exceptional long life of Exide-Ironclad Batteries, provide the lowest cost source of *dependable, full shift* power that can be bought *at any price.*

Write for more facts and FREE copy of Exide-Ironclad Topics. It contains latest developments in materials handling . . . shows actual case histories.

THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

"Exide-Ironclad" *Reg. Trade-mark U. S. Pat. Off.*

"Best Gyratory Sifter We've ...says FRED SANDERS

Confectioners and Bakers
DETROIT, MICHIGAN

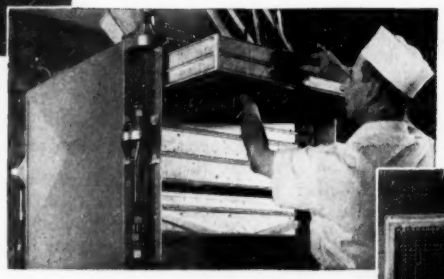
INSTALLED IN THE NUT ROOM of their candy shop and used for the sifting and grading of chopped nuts for ice cream, confectionery, bakery, etc., this Allis-Chalmers all-metal gyratory sifter is doing an outstanding job for the Fred Sanders firm.

This small, compact machine easily handles the 1500 lb per hour capacity of the chopper, has required practically no maintenance and has *eliminated* vibration problems formerly encountered with a large, cumbersome grading screen.

The all-metal *Low-Head* gyratory sifter has proven itself to be a time-saving machine for *many* food industry applications. Get full details by contacting Allis-Chalmers *now!*

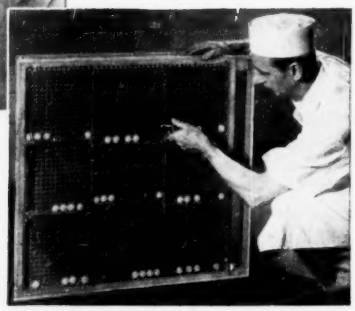
COMPACT, EFFICIENT LAYOUT

Note the sanitary, practical production arrangement. Drums of whole nuts are tilted into the chopper by means of an electrically-controlled platform . . . conveyor brings chopped nuts to hopper above *Low-Head* sifter . . . nuts are then graded five ways and fed through heavy cloth sleeves into sanitary easy-to-move metal containers. Sifter is mounted on specially-constructed stand — making a compact, efficient layout.



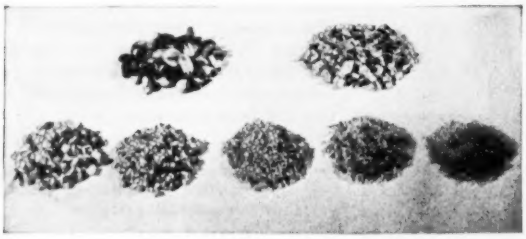
EASY TO REMOVE AND REPLACE SIEVES

Front panel comes off in a jiffy . . . and the warp-proof magnesium sieves slide smoothly in and out like drawers in a cabinet.



EASY TO CLEAN

Sieves can be quickly cleaned with an air hose (above) or can be safely *washed* in hot or cold water without fear of damage.



EXCELLENT RESULTS

Five grades of chopped nuts — from *fine* to *coarse* — are provided by the 3, 4, 5, 6, and 8-mesh wire screens used in this sifter. A wide range of mesh sizes are available for practically any sifting need.

ALLIS-

SERVING THE

Ever Used"

ALL-METAL *Low-Head* GYRATORY SIFTER

SEND FOR LITERATURE

Get details on this packaged unit — complete with *Texrope* V-belt drive and 1 hp Allis-Chalmers motor — from any A-C sales office. Or, if you prefer, fill out and send the handy coupon. We'll forward illustrated, fact-packed literature.

A-3134

ALLIS-CHALMERS, 1113A SO. 70 ST.
MILWAUKEE, WIS.

Please send handy packet with information on new all-metal *Low-Head* sifter and bulletin 06B6124A on standard sifter.

Name ..... Title .....

Company ..... Street .....

City ..... State .....

Low-Head and *Texrope* are Allis-Chalmers trademarks.

CHALMERS

A-C ALLIS-CHALMERS

FOOD INDUSTRY FOR 103 YEARS

3 IMPORTANT ADVANTAGES

Standard Oil's Lubrication Service is especially geared to serve your midwest operations.

1 SERVICE-SUPPLY POINTS are near your plant. You are assured of fast deliveries, prompt lubrication engineering service.

2 LUBRICATION SPECIALISTS have been specifically trained in Standard Oil Lubrication Engineering Schools to help you obtain the maximum benefits from lubricants and fuels.

3 RESEARCH AND TECHNICAL FACILITIES are geared to help solve your specific lubrication problems.

Schooled to serve you...

YOU benefit when these men go to school!

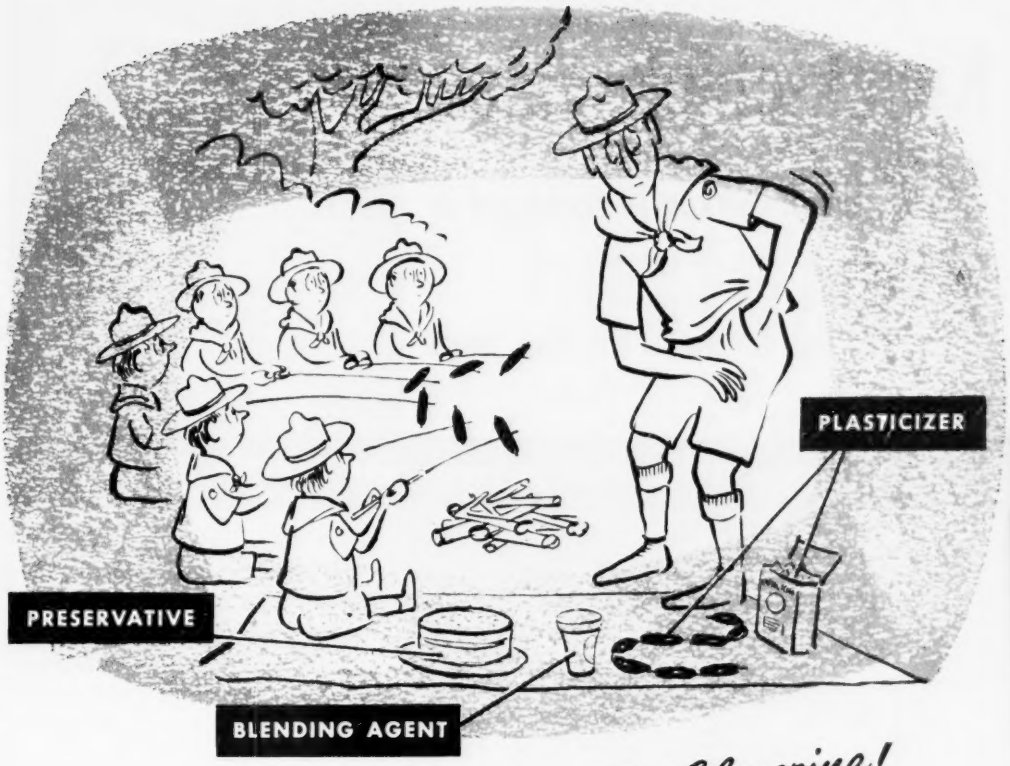
These men are Standard Oil lubrication specialists, skilled and experienced in the use of modern lubricants. They are representative of the groups who come year after year from Standard Oil Company (Indiana) sales fields throughout the Midwest to learn about new machinery and the most up-to-date methods of lubricating them. In lecture rooms and in well-equipped laboratories, they are taught new ways to raise economy and efficiency of your operations.

The benefits held out to you by these lubrication specialists are multiplied by a service-distribution set-up that is unique in the oil industry. To serve your midwest operations, Standard Oil has located practically right in your own backyard a completely stocked warehouse and the office headquarters for a lubrication specialist. The nearness of this service-supply center *means faster deliveries to you* of necessary fuels and lubricants. It assures you of getting the product you need when you need it. It puts the services of the lubrication specialist at your immediate disposal.

These advantages are well worth investigating. Arrange, now, for the visit of a lubrication specialist. If your plant is located in any of the states below, simply phone your nearby Standard Oil service-supply center or write to: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Montana, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, Wisconsin, Wyoming

STANDARD OIL COMPANY (INDIANA) STANDARD



One item you can't forget—Glycerine!

Versatile Glycerine crops up again and again as an ingredient in a variety of food staples, candies, ice cream and beverages! Because it is *absolutely safe to use*, and actually wholesome and nutritious —it has become a standard sweetener, humectant, solvent, preservative and blending agent in innumerable food products. Are you sure you're familiar with the prominent role Glycerine plays in food processing? The numerous applications listed in "*Why Glycerine for Foods?*" may surprise you! Why not write for a free copy?

Equally important, Glycerine serves the nation as an invaluable adjunct in the manufacture of food wrappings, sausage casings and other non-toxic packaging materials. Its possibilities in improving the appearance and palatability of dried fruits is indicated by a patent which has recently come into public domain. The process consists essentially of spraying or immersing the fruit in Glycerine or an aqueous solution thereof which is said to retard drying out and crystallization in storage. Full details will be sent on request.

Nothing takes the place of Glycerine

GLYCERINE PRODUCERS' ASSOCIATION
295 Madison Avenue, New York 17, N. Y.

PLEASE SEND A COPY OF
"WHY *Glycerine for Foods?*" ☐

Please send further information on dried fruit process ☐

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

Kwick-chick sales soar *when chicken is packaged in* VISQUEEN* *film bags*

Here's more proof that premium packaging with VISQUEEN film pays off

All the mouth-watering appeal of the crisp, golden yellow fried chicken is instantly seen through the pure, strong, transparent VISQUEEN film. *Customers like that!* After the chicken is out, the reusable bag is easily washed clean and ready for unlimited other jobs—a premium plus. *Customers like that!* The odorless, waterproof and crack-proof VISQUEEN film keeps the chicken absolutely perfect. *Customers like that!*

Don't overlook extra profits—look over VISQUEEN *film now!*

when you think of polyethylene film for packaging—always think of VISQUEEN!

Whether your product is fresh, frozen, dried or preserved . . . VISQUEEN will reduce waste and spoilage, cut costs, increase sales. BUT REMEMBER—THIS IS IMPORTANT. ALL VISQUEEN film is polyethylene, but not all polyethylene film is VISQUEEN. VISQUEEN is the only film produced by the process covered by U. S. Patent 2461975. Only VISQUEEN film has the benefit of the research and extensive technical experience of The Visking Corporation. Always say VISQUEEN and be sure.

*T. M. The Visking Corporation

VISQUEEN film . . . a product of

THE VISKING CORPORATION

PRESTON DIVISION, TERRE HAUTE, INDIANA

SOLVAY

Trade Marks SOLVAY and Registered U.S. Pat. Off.

QUALITY PRODUCTS for FOOD PLANT CLEANING

Solvay offers you a superior line of cleansers for the food plant. Whatever your needs may be, you may be sure that there is a Solvay cleaning product to fit them. You may be sure, too, of the quality of these products . . . for Solvay is America's first and oldest producer of alkalies and associated chemicals. For cleansers of dependable quality, specify Solvay.

for General Cleaning

New! Improved!

1 CLEANSER No. 600

A new, greatly improved formulation of one of America's best known general maintenance cleansers. Five modern ingredients combine their special properties to make "tough" cleaning jobs easier, more economical.

2 CLEANSER No. 615

A brand new cleanser of the 600 series, Cleanser No. 615 provides more detergent action for more difficult cleaning jobs. Specially developed for hard water, this product substantially cuts cleaning costs in these areas.

3 NYTRON

Solvay's new, exclusive wetting agent-detergent. Not an alkali, not a soap, not a mixture. Exceptional detergency and rinsability—in hot or cold, hard or soft water—combined with mildness and safety give Nytron a wide variety of uses in the food plant. It will not dull painted or polished surfaces . . . use it for regular cleaning of equipment, floors, walls, windows, trucks, etc.

4 GREEN LABEL COMPOUND

A new, low-cost, high-performance general cleanser. Contains the most modern materials, including a special wetting agent. Provides exceptional performance at a low price.

5 SUPERSHEEN

Sets a new standard for machine dish-washing performance. Excellent in hard or soft water. Prevents the formation of lime scale, keeps the machine and spray jets clean. Safe for tin and aluminum utensils; wonderful for removing baked-on soil.

for Special Cleaning

6 SCOURING CLEANSER

A Solvay cleanser for stubborn soil. In addition to abrasive action, this product has excellent wetting, penetration and rinsability.

7 CAN WASHING CLEANSER

A brand new Solvay cleanser for machine can washing. Particularly effective for baking pans, dairy cans, mixing vessels, etc.

for Bottle Washing

8 ANCHOR ALKALI

One of America's largest selling bottle washing cleansers because it produces bright, sparkling-clean bottles at minimum cost. Anchor Alkali sterilizes effectively and rinses quickly and completely.

9 ACE ALKALI

Solvay's brand new bottle washing cleanser. A premium product for premium performance . . . Ace Alkali produces exceptional results in the most difficult bottle washing operations and with the hardest water.

10 SPECIAL FLAKE ALKALI

For hydro and spray type bottle washing equipment, where foaming is a problem, specify Solvay Special Flake Alkali for best results.

for Heavy Duty Cleaning

11 CAUSTIC SODA

A basic alkali from America's oldest and largest producer. High pH and high neutralizing value give Solvay Caustic Soda "bite" that will do the most difficult cleaning jobs with highest efficiency.

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Allied Chemical & Dye Corporation
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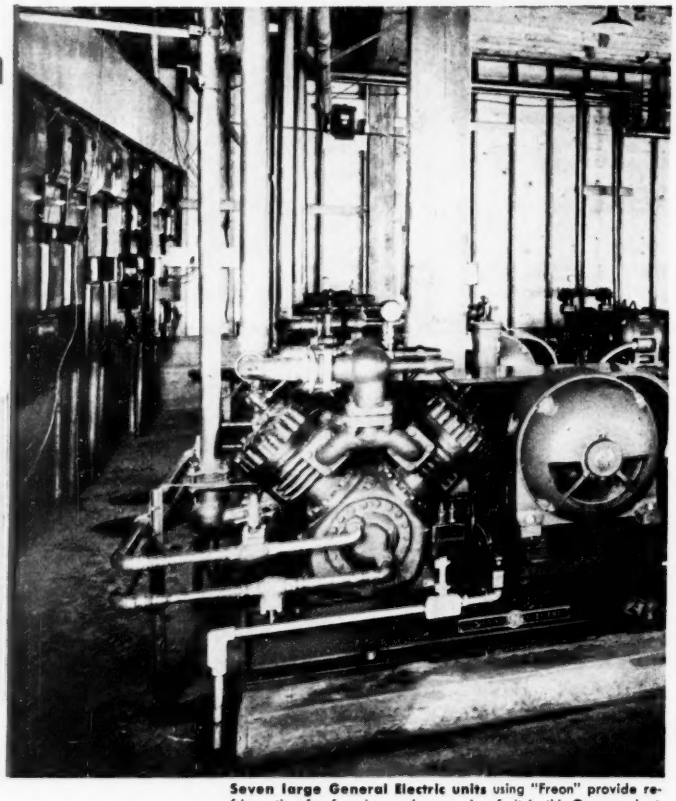
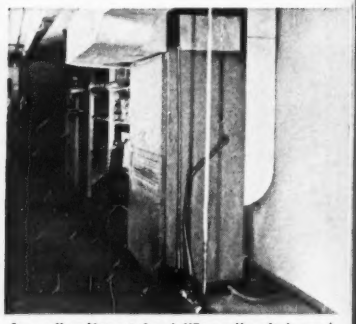
Large installation



Seven large General Electric units using "Freon" provide refrigeration for freezing and processing fruit in this Oregon plant.

or small . . .



A small self-contained "Freon" unit is used in the storage room of this bakery where milk solids and other perishables are kept.

for safer refrigeration rely on "Freon" refrigerants!

No matter how large or small the operation, refrigeration safety is a factor of utmost importance in the frozen foods industry. That's why the choice of refrigeration and air conditioning equipment should be made with deliberate care.

Naturally, you want equipment designed to use the safest refrigerants . . . so food won't be contaminated if a leak should develop. And you also want equipment to give you years of trouble-free performance.

These are good reasons for selecting systems designed to utilize "Freon" safe refrigerants.

"Freon" refrigerants *are* safe. They're nontoxic, nonflammable, noncorrosive, tasteless and practically odorless. And as for economy . . . "Freon" refrigerants actually help to prevent equipment breakdowns! That's because they contain no acids . . . won't corrode vital parts or react unfavorably with lubricating oils. They're extremely dry, too, practically eliminating risk of freezing in capillary tubes and valves.

It's easy to see why so many people in the frozen foods industry insist on equipment designed to use "Freon" refrigerants. The next time you consider a refrigeration or air conditioning installation—large or small—be sure to ask your engineer or equipment manufacturer about the advantages of "Freon." He'll be glad to tell you how equipment utilizing "Freon" can better safeguard your investment.

E. I. du Pont de Nemours & Co. (Inc.), "Kinetic" Chemicals Division, Wilmington 98, Delaware.

DU PONT

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

KINETIC

FREON

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SAFE REFRIGERANTS

"Freon" is Du Pont's registered trade-mark for its fluorinated hydrocarbon refrigerants.

the right analysis is important

The right analysis is what counts in the selection of stainless steel for a particular job. Since stainless is a whole family of steels in a variety of grades and finishes, its use must be carefully planned. Crucible, pioneer in the development of these specialty steels, makes freely available to you the services of an alert metallurgical staff. These engineers and metallurgists are experienced in the application of stainless steels to countless requirements . . . and they can show you the stainless analysis best suited for your needs.

Crucible tackles every Industry-posed problem with the same careful attention to detail that is the measure of Crucible's half century of specialty steel leadership. Your application can benefit from this experience, and we are well prepared to help you. So, when you think of stainless . . . call Crucible. One word from you puts us to work for you.

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CRUCIBLE first name in special purpose steels

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Ask any Dietitian—she'll tell you

"Enriched Foods and Fortified Foods are *Preferred* Foods"

AMERICAN dietitians and nutritionists long ago added their endorsement to the Bread and Flour Enrichment Program. And again they have been proved right by the results of the large-scale Newfoundland Nutrition Surveys.

These authoritative surveys reaffirmed that enriched and fortified foods promote better bodies, *healthier* bodies, sharply reduced infant mortality, lower tuberculosis and over-all death rates—improvement in both the quantity and quality of life.

When you enrich and fortify with Merck Vitamin Products you *know* that the faith of millions of Americans is fully protected. Merck Vitamin Products come from the same organization that pioneered in the research and large-scale development of thiamine, riboflavin, niacin, vitamin C, and other important nutrients. And now, the most recent contribution is thiamine mononitrate, a form of thiamine that has the advantage of greater stability in certain food applications.

With the enrichment program, as well as general food fortification, steadily growing in stature, Merck continues to lead in every distinct, forward step.

Merck Vitamin Products for Enrichment and Fortification

VITAMIN B_1
Thiamine Hydrochloride · Thiamine Mononitrate

RIBOFLAVIN (Vitamin B_2) **NIACIN** (Nicotinic Acid)

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that UPGRADES all your ideas about folding carton service!

Order your next supply of folding cartons from United Board & Carton and let yourself in for a pleasant surprise.

After you place the order, you can forget the rest. We do all the worrying. All the planning and execution. All the checking and re-checking. All the follow-up of countless details, even to making the paperboard in our own mills so that we can be sure the stock exactly fits your needs.

Shipments go out on *schedule* . . . from a conveniently located box factory. They arrive when you want them.

A few of the nationally famous companies who use United Board & Carton services

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Muench-Kreuzer Candle Co., Inc.
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ON SCHEDULE carton building takes a lot of doing, but it's a regular part of the dependable service which has made United Board and Carton a favorite with [illegible] users for more than half a century. Want more details? A letter or wire will bring them.

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We're interested in what goes in—too!

CONCENTRATES

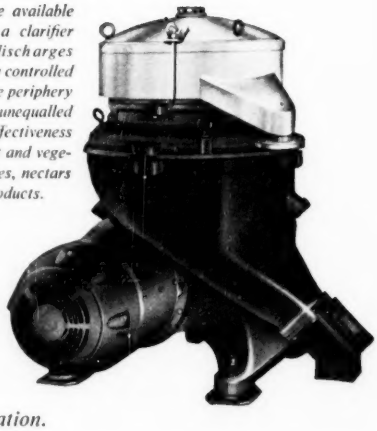
The SHARPLES DV-2

To make it possible for food processors to produce concentrates of better quality and greater purity—continuously—The Sharples Corporation developed the DV-2, a continuous solids discharge centrifuge which:

- Permits external control of solids content of the product
- Assures peak clarifying efficiency to produce maximum purity
- Provides ability to concentrate solids to a high degree, as desired, with minimum loss of mother liquor with solids.

Here then, is a new processing tool that provides production control never before possible. No other centrifuge and no other method has ever approximated the performance of the DV-2.

A continuous centrifuge available as a separator or as a clarifier which automatically discharges solids through externally controlled valves located around the periphery of the bowl. The DV-2 is unequalled in its versatility and effectiveness in the processing of fruit and vegetable juices, soups, purées, nectars and many other food products.



For complete information, get in touch with The Sharples Corporation.

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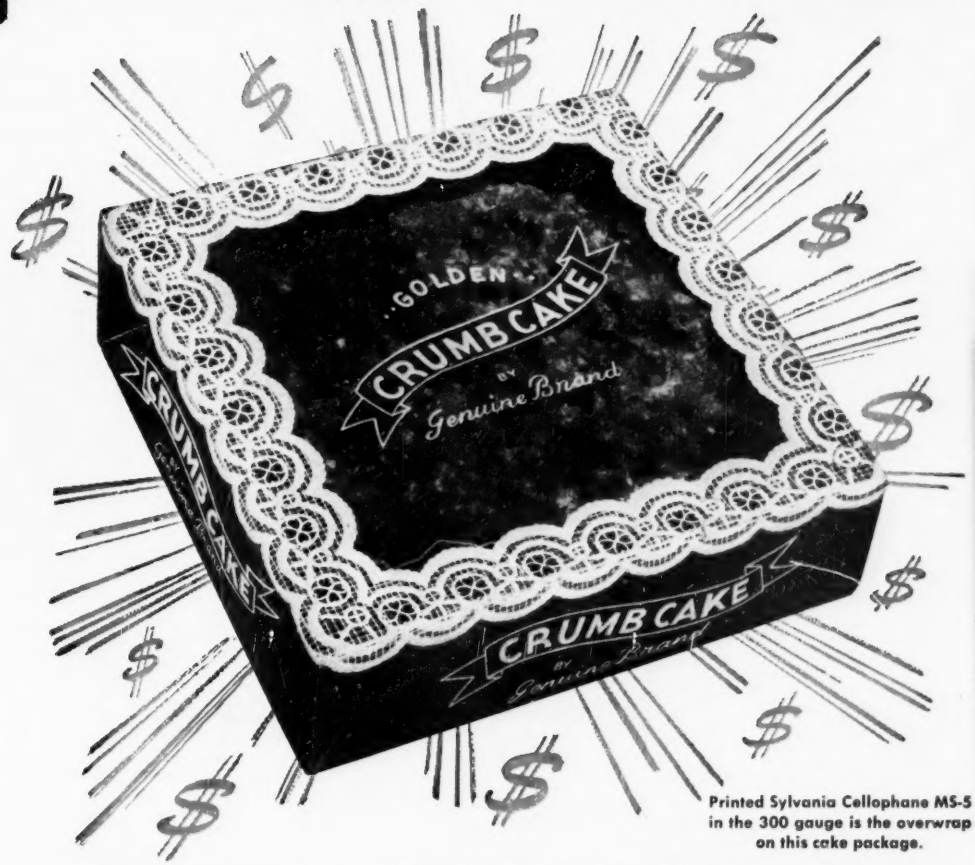

Printed Sylvania Cellophane MS-5 in the 300 gauge is the overwrap on this cake package.

Specific properties tailored to your product tell why:

1 Low cost
2 Moisture protection
3 Transparency
4 Sales appeal
5 Excellent printing surface

SYLVANIA® CELLOPHANE

Mr. Cellophane is always available to help you solve your packaging problems. Talk over your requirements with your Sylvania representative or write us mentioning the specific application in which you are interested. Address: Market Development, Dept. F-10.

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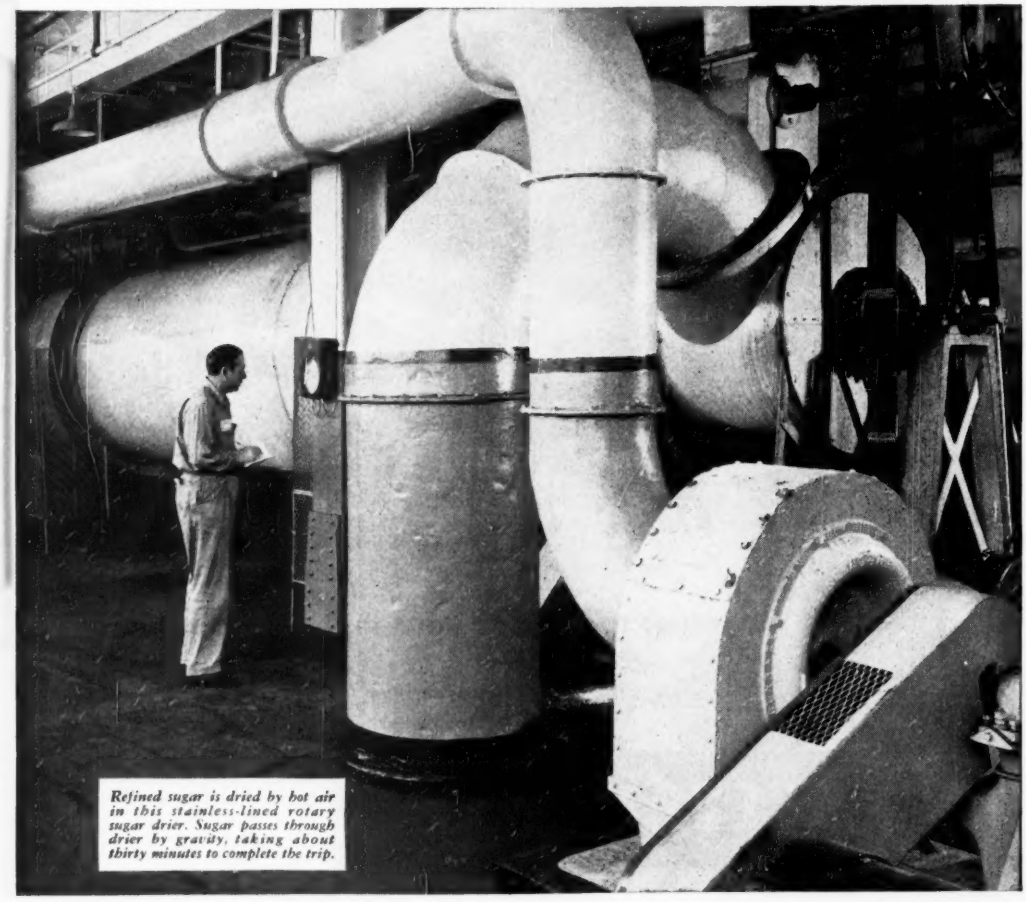
Enduro®

STAINLESS STEEL



Refined sugar is dried by hot air in this stainless-lined rotary sugar drier. Sugar passes through drier by gravity, taking about thirty minutes to complete the trip.

REPUBLIC STEEL

REPUBLIC

***Alloy Steel Division, Massillon, Ohio* • GENERAL OFFICES**

THRIFTY METAL OF 10,000 USES

Scalper Screens of ENDURO Stainless Steel and Enduro-lined Rotary Sugar Driers see to it that from corn kernel to refined sugar the process is without contamination. Wherever food is processed, maintenance of quality, color, flavor is assured when its only contact is ENDURO.

SILVERY LINING...TO SWEETEN PROFITS

The smooth, silvery ENDURO lining of these Rotary Sugar Driers does just that —*sweetens* profits.

ENDURO Stainless Steel sweetens profits by cutting maintenance and processing costs. It is easy to clean and keep clean. It is highly resistant to rust, corrosion, most acids and alkalies—hot or cold. With ENDURO in the process lines, there is little interruption of processing, little "down-time" to dilute profits.

ENDURO also sweetens profits by guarding product quality—color, flavor, clarity —and with it, public acceptance and sales. ENDURO is chemically inert—does not in any way alter the characteristics of the product in process. Its smooth, pore-free, sanitary-as-glass surface affords no foothold for bacteria or contaminants. Purity is assured with ENDURO.

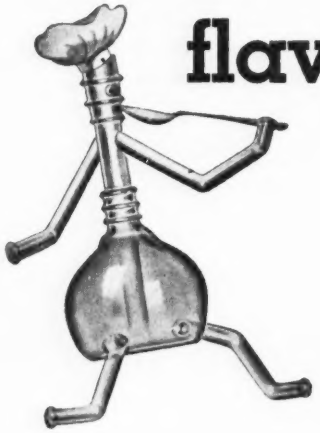
Added to all this—its unusually long, trouble-free life makes it long-range economy to equip your process line from start to delivery with ENDURO—*profit sweetener!* Ask your equipment manufacturer for details today!

✓ ***Check All 10 Advantages:*** • RUST- AND CORROSION-RESISTANCE • HEAT-RESISTANCE • HIGH STRENGTH • NO METALLIC CONTAMINATION • SANITARY SURFACES • EASY TO CLEAN • EYE APPEAL • EASY TO FABRICATE • LONG LIFE • LOW END COST.
What More Can Be Desired in a Material?

STEEL CORPORATION

CLEVELAND 1, OHIO • ***Export Department: Chrysler Building, New York 17, New York***

ah! what delicious flavor



You'll agree, your customers will agree, it's the FLAVOR that makes the meal.

D&O has the Perfect Flavor and the correct flavoring materials to serve your every specific flavor requirement starting from shrimp cocktail sauce, to soup, to gravy... including powdered dessert and cake frosting.

SPICEOLATES,

the water-soluble spice flavors made by D&O from pure natural oils and oleo resins offer greater economy and completely uniform flavor quality. Spiceolates are pure products in every respect.

Additional information concerning the use of Spiceolates on request.

For better flavors . . . consult D&O.

D&O

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in this New Extra-Duty Safety Line of

PIONEER **STANZOIL**

RED NEOPRENE

Coated Canvas Gloves

Exclusive Pioneer Non-Slip Grip Holds wet things as if dry.

Curved Fingers Extra comfort and efficiency.

Preflex-Palm Design Prevents wear from bunching.

Inserted Thumb Design No inside seam to wear through quickly.

Heavy Red Neoprene Coating Liquid-resistant, durable.

Entire Glove is full weight 8 oz. canton flannel Comfort, long wear.

Compare these new safety red neoprene coated canvas gloves with any others anywhere and you see the extra hand protection, extra wear, extra durability in oils and acids, extra work and efficiency only STANZOILS give you. For less cost-per-hour, more work-per-day, write for full information about these Extra-Duty STANZOIL neoprene coated canvas gloves, today. *The Pioneer Rubber Company, 673 Tiffin Road, Willard, Ohio.*

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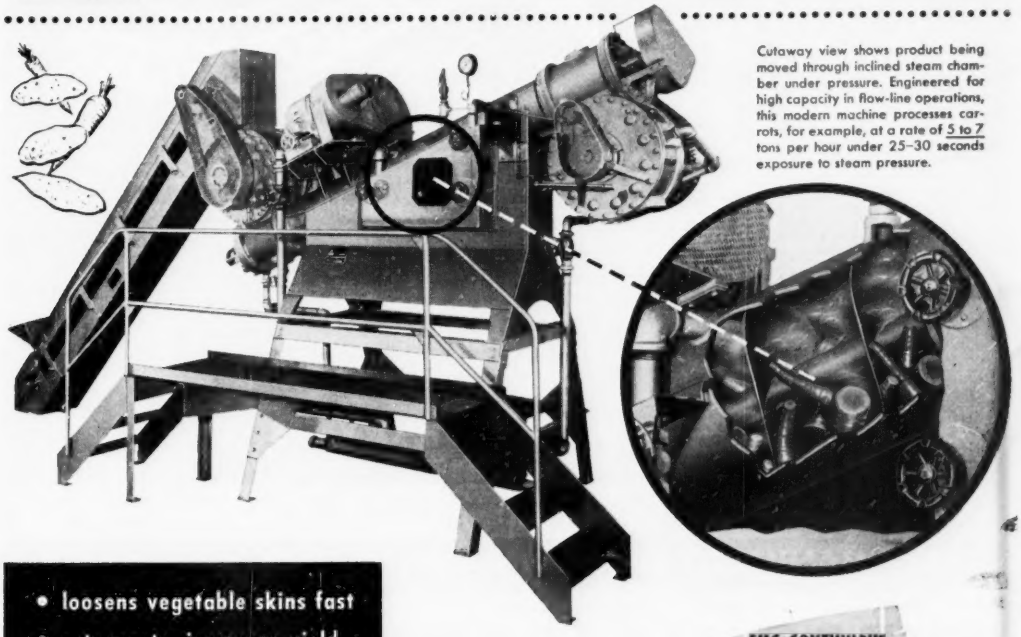
fmc Continuous High-Pressure Steamer



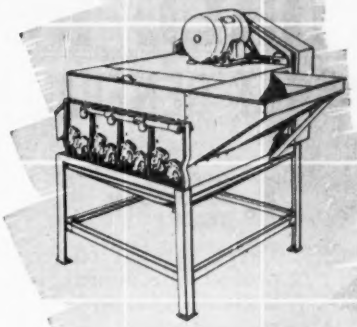
Cutaway view shows product being moved through inclined steam chamber under pressure. Engineered for high capacity in flow-line operations, this modern machine processes carrots, for example, at a rate of 5 to 7 tons per hour under 25–30 seconds exposure to steam pressure.

- loosens vegetable skins fast
- cuts waste, increases yield

The FMC Continuous High-Pressure Steamer loosens primarily root-type vegetable jackets or skins, quickly and efficiently. Complete, uniform loosening is performed within the inclined cylindrical chamber through automatically-controlled heat penetration of high pressure steam. Highly effective and economical, this FMC method of processing facilitates final skin removal without eliminating valuable sub-surface nutritional layers. The results: increased yields, improved product quality, minimum peeling loss.

Write for full information, or call your nearest FMC representative

FMC CONTINUOUS *ABRASION-TYPE* VEGETABLE PEELER



Employs revolving abrasive action rolls for quick, thorough, continuous peeling of vegetables. Normal average capacity—2 tons per hour.

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Ship in JIFFY INSULATED BOXES to preserve *your* perishables and SAVE MONEY.

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3. NO CEREAL TASTE OR ODOR!

Paygel can pay off for you in better products, lower costs and increased profits! This amazing wheat starch *costs less* than imported root starches; it gives you *superior* products with less trouble.

Chemically modified and highly purified, Paygel is produced by General Mills under rigid laboratory controls. It is a thick-boiling starch that produces outstanding results in soups, salad dressing, pie filling and custards.

In the candy field, General Mills offers:

B-2455 Starch Highly purified and modified but has a *thin-boiling* characteristic. B-2455 is particularly useful in manufacture of gum confections.

Free samples of Paygel and B-2455 wheat starches are available on request. Find out how one or both of these wonder starches can help you. Write or wire—

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Special Commodities Division

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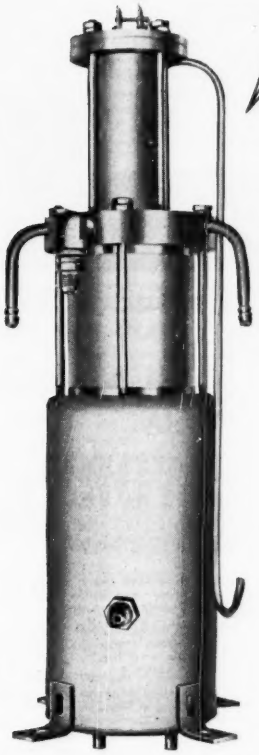
OK meets pure food standards

Good saves 25% on material costs with *Carpenter* Stainless Tubing



This carbonating unit for beverage dispensing contains 5 sizes of Carpenter Stainless Tubing, 2 sizes polished on the I.D. to reduce turbulence and friction. By working with Carpenter, the fabricator reduced his tubing costs by 25%.

Smooth tube surfaces, inside and out, give food handling equipment extra sanitary features—when the Stainless Tubing comes from Carpenter.

On this job, they are getting *more than* sanitary features and the strength needed to control pressurized gas. By working with Carpenter and the nearby Carpenter Distributor, they found a way to reduce material costs by 25%. And fabrication of Carpenter Stainless Tubing in five sizes was a snap.

To get the sanitary protection you need, to get it at a saving, be sure to discuss your Stainless Tubing problems with Carpenter.

... Analysis—Tolerance—Finish

guaranteed on every shipment

This 12-page booklet of useful information about corrosion resistance, sizes, analyses, etc., is yours for the asking. Just drop us a note on your company letterhead and tell us you want a copy of the Carpenter Stainless Tubing Data File.

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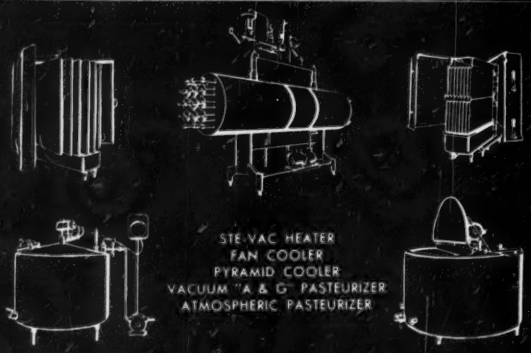
Carpenter

STAINLESS TUBING

—guaranteed on every shipment



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PYRAMID COOLER
VACUUM "A & G" PASTEURIZER
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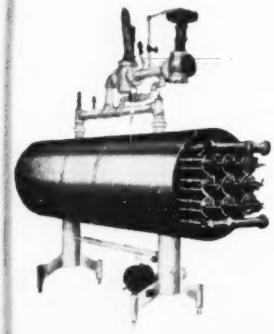
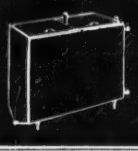
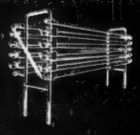


The STE-VAC HEATER

BEVERAGE COOLERS

INDUSTRIAL CHILLED WATER UNITS





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Chester-Jensen Company

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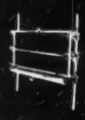

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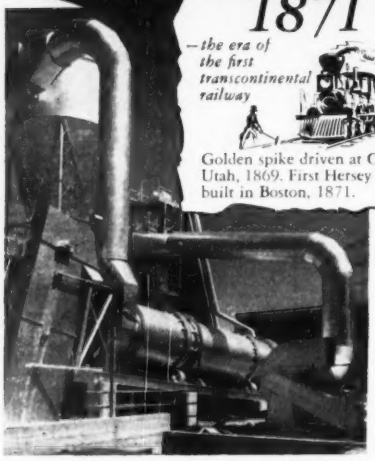

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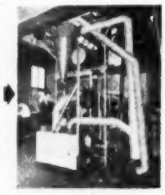

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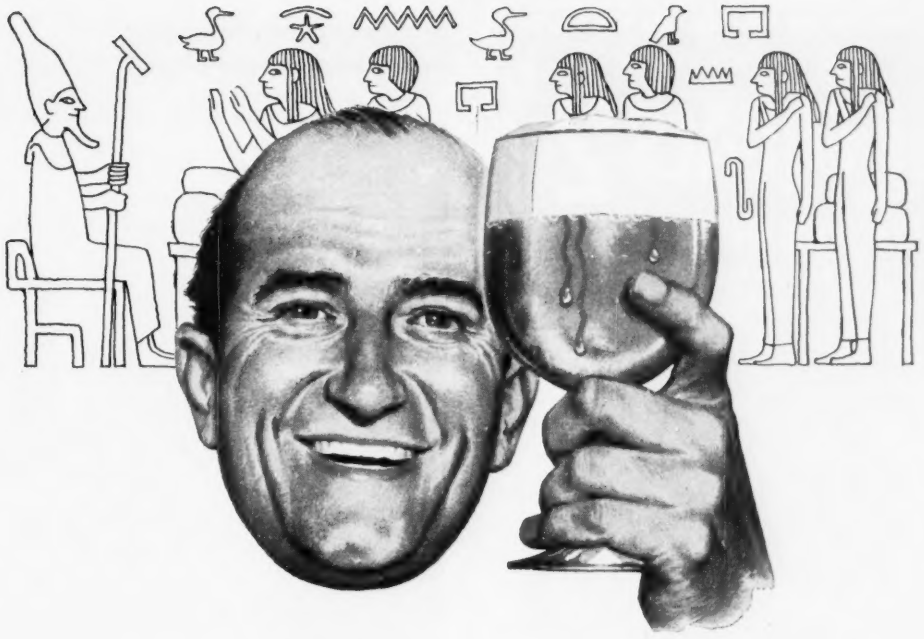

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A CASE OF SIMPLE ARITHMETIC

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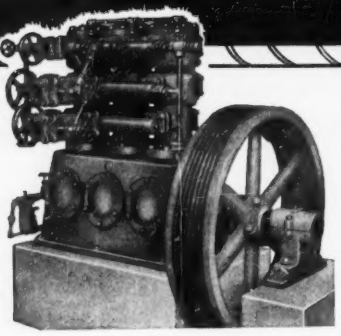

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**Letter on file.*

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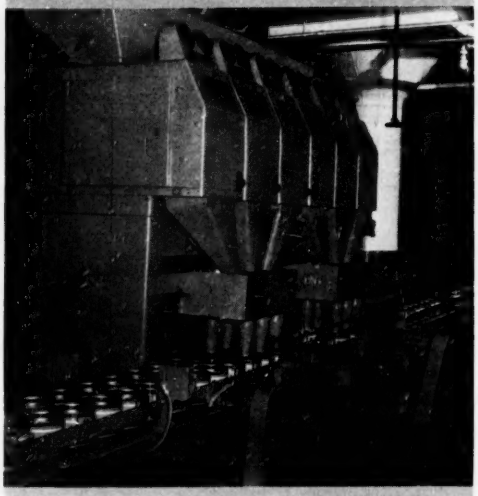
PACKAGING COSTS DOWN 65%*



...SINCE MODERNIZING WITH TRIANGLE PACKAGE MACHINERY

* average figure

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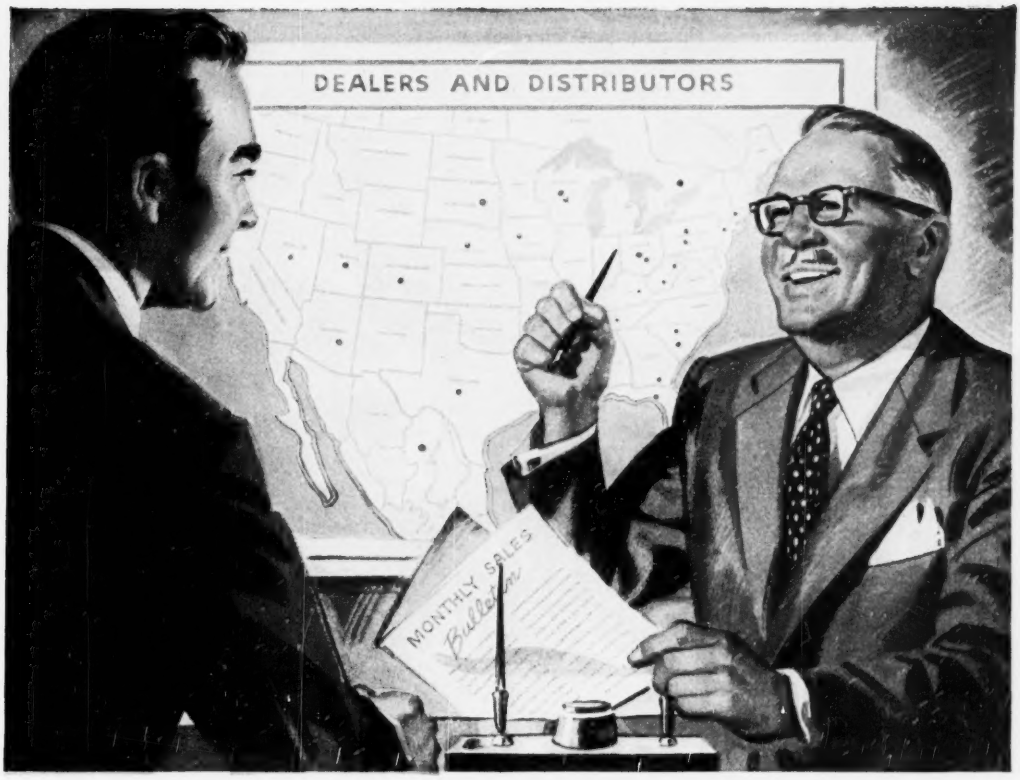

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